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September, 1925

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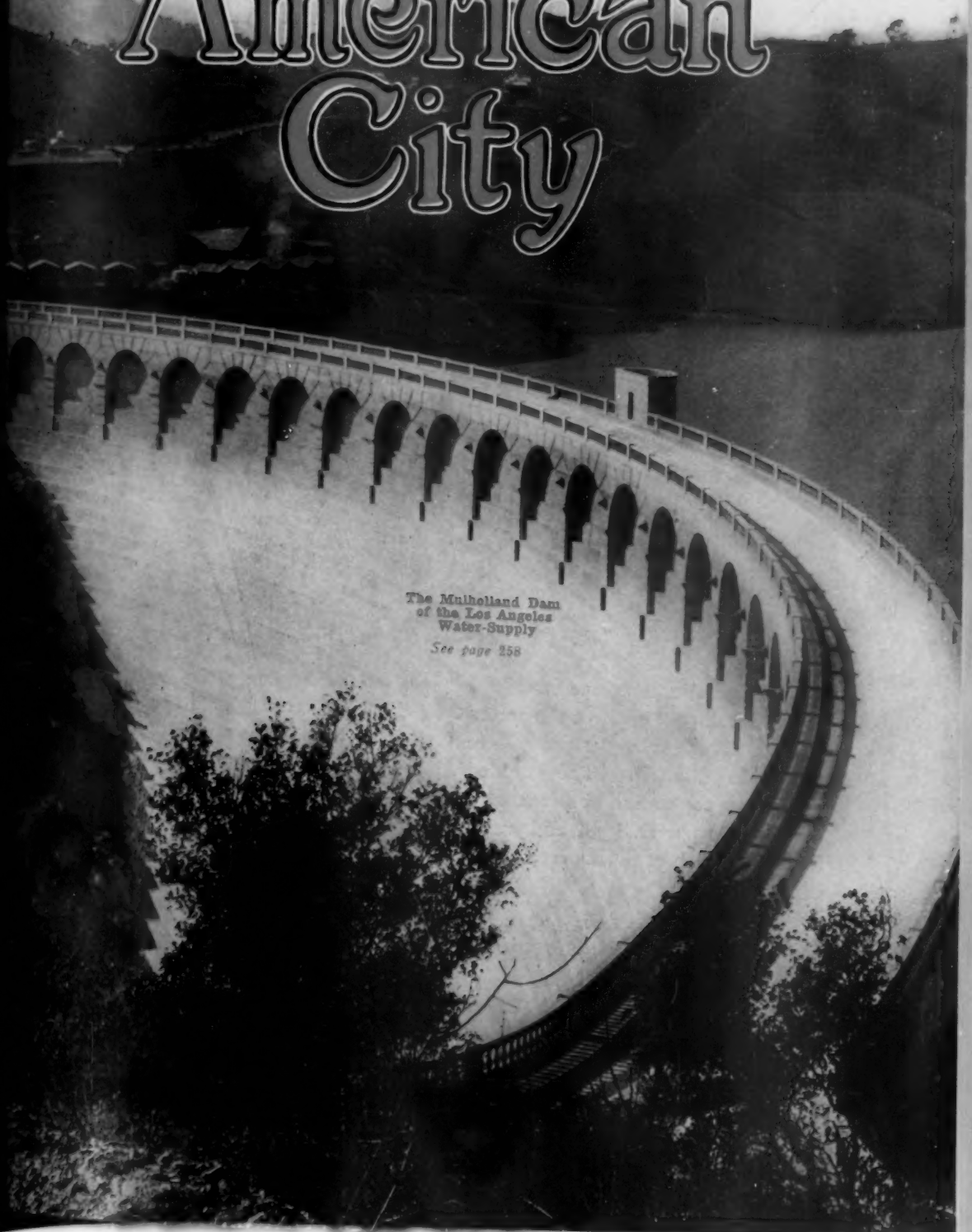

The Mulholland Dam of the Los Angeles Water-Supply

See page 258

FULTON DIESEL

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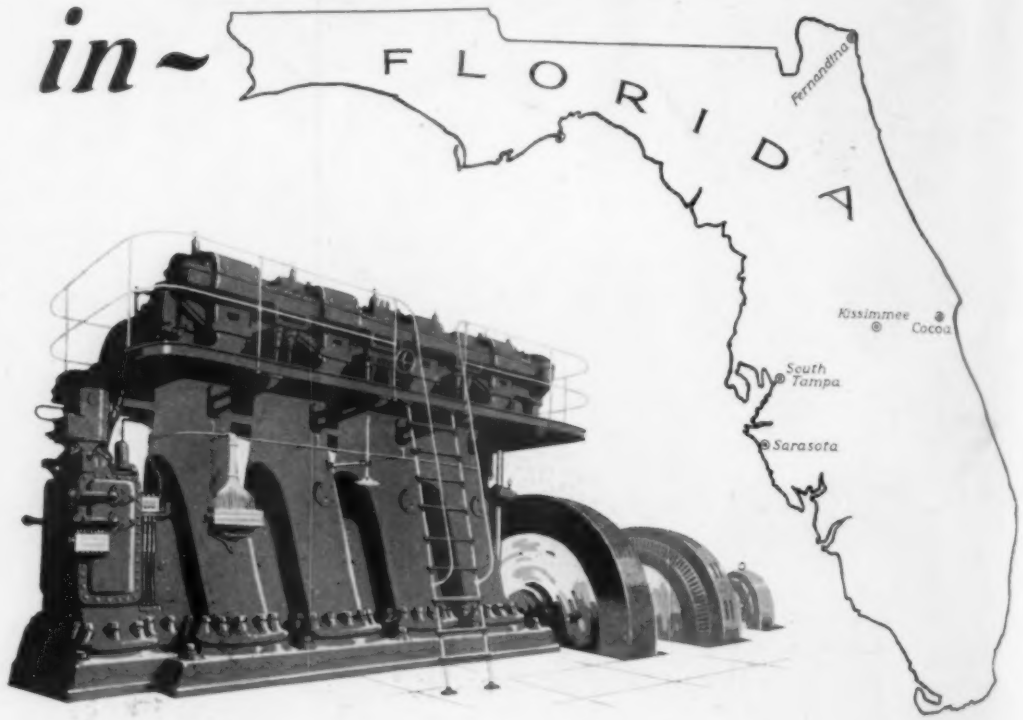

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The American City Magazine

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Improvements on Grounds around New Public Buildings in Portland, Maine

By William J. Dougherty
Secretary-Engineer, Park Commission

ALTHOUGH listed in the annual census of 1924 as a city of approximately 70,000 people, Portland, Me., can boast many public buildings of a type and size which would do credit to a city of much larger population. Within the last year the city has completed the construction of a million-dollar high school in the Deering district of the city, and has also constructed the new Central Fire Station on a plot of land in the heart of the city.

Portland is indeed fortunate in having these two important additions to its list of public buildings placed on plots of ample size for the proper development of the surrounding grounds areas. In the cases of several of the city's most costly buildings built some few years ago, it is unfortunate that these structures have not been placed on plots of a size adequate to give the building a proper "set-off" by landscape development. When conditions permit, there is much of value gained from an esthetic standpoint if one is able to "soften" the cold granite structures by landscape treatment. The writer believes that the tendency is, more and more, to place important public buildings in a setting which tends to the natural in the form of lawns, trees, shrubs, etc.

The Deering High School—which, by way

NEW DEERING HIGH SCHOOL, PORTLAND, SHOWING PART VIEW OF DEVELOPMENT IN PRESUMPSCOT PARK

of proud mention, is the city's second million-dollar high school of a decade—is placed in Presumpscot Park, a city park of 28 acres. This setting should provide ample space for all possible recreational needs incident to school life for a long time in the future. The building itself is of English architecture, and the accompanying photograph shows the low-running style of the building. The building is set back 100 feet from the building line of the principal street (Stevens Avenue) in this area. The grounds development surrounding the building presents no unusual features, but it may be of interest to comment briefly on the landscape work which was accomplished by the Park Commission of the city.

The approach-walks to the building were constructed of common red brick, this being in keeping with the color of brick in the building. The walks are flanked with Japanese barberry hedge plants. At the corners of the meeting walks, and at the entrances to the building, small clump plantings of flowering shrubs are introduced, among which are snow-hill hydrangeas, the peegee hydrangeas, spirea anthony waterer (the double-blooming red flower spirea), and spirea vanhoutii or common spirea. To the right and left of the main entrance on the terraces there is a fairly dense planting of young evergreens; in this assorted group there is the popular Kosters blue spruce, the Canadian hemlock, the Mugho pine, Austrian pine, Douglas dwarf spruce, Swiss stone-pine, the American arborvitæ, and others.

The corners of the rectangular spaces of lawn fronting on Stevens Avenue are planted with specimens of dwarf pines and blue spruces, and half-way back in the plots are placed selected mountain ash specimens taken from the city nursery. One very fine pin oak is placed on the lawn just to the left of the approach-walk to the south wing, and along the property division lines on the north and south lot bounds respectively is a mass planting of hardy flowering shrubs, among which are the cranberry high bush, the snowberry, the red flowering dogwood, the rosa rugosa (wild red rose), Japanese barberry, ibota privet, flowering almond, and forsythia. These boundary plantings are fringed with German iris and hardy phlox to give an added touch of color.

It has been the hope of the designers of this building to see the structure clothed with vines, and consequently there has been planted along the borders of the building the popular and hardy ampelopses veitchii or commonly called Boston ivy. On the sloping lawns in the rear of the building there is a dotted planting of Lombardy poplars which partly serve to screen the rear view onto the building, and onto the broad gravel terrace which is reserved for auto parking.

This terrace is bordered with shrub plantings of rosa rugosa and forsythia suspensa, and several irregular clump plantings of flowering shrubs flank the service road which leads from the left and around to the rear of the building.

A small group of white birches is placed in an open area of lawn on the northerly side of the building. Along the esplanades on the Avenue it is planned, the coming spring, to have a street planting of shade trees; the selection for this being the splendid schwedlerii maple, which is foremost in the maple group and is widely known for its adaptation to street planting.

The Central Fire Station

With the completion of the Central Fire Station early this spring Portland has added to its public buildings a structure much needed to house the up-to-date fire apparatus of the city. This accomplishment reflects a long and persistent endeavor on the part of former officials of the city, for, apart from the financial considerations and the varying opinions as to proper location, it has been necessary to invoke statute law to permit of this structure being placed on land under control of the local Park Commission. The station is built on an extension to Lincoln Park, which is one of the oldest parks and is located in the very heart of the city. In very close proximity to this area stands the million-dollar City Hall, and the million-dollar Cumberland County Court House, and on the adjacent city block is the Federal Court House, all buildings of splendid architecture.

The new station is 100 x 80 feet in size, and centrally located in a plot approximately 230 x 190 feet, comprising a complete city block. This setting permits of ample lawn margins around the building, with resultant enhancement of the beauty of the station. The plot is entirely surrounded by a raised granite curb of 8-inch thickness, and this serves as a clear definition of the plot as well as a safeguard for the border plantings. The sides of the plot are planted with border-hedge plants of ibota privet, and at the corners plantings of hydrangea and forsythia have been made. Midway on the two sides of the plot, just back of the privet hedge, there

AERIAL PHOTOGRAPH OF NEW CENTRAL FIRE STATION, SHOWING FEDERAL COURT HOUSE ON RIGHT AND CUMBERLAND COUNTY COURT HOUSE AND LINCOLN PARK ON LEFT

are plant'ngs of rosa rugosa, which give color as well as serving to break somewhat the lengthy line of hedge. Only two umbrageous trees have been placed on this plot and these are the schwedlerii maples. At the corners of the building and close to the service walks which border the sides of the building, there are small mass plant'ngs of assorted evergreens, for the most part dwarf varieties. On three s'des of the building there have been planted rambler roses of the Dorothy Perkins variety, and in circular plots to right and left of the broad concrete approach-drive to the station there are raised beds of cannas surrounded by border plants of salvia. Several varieties of geraniums planted quite generously along the borders of the building, plus the well-filled window boxes, give sufficient brightness of color for the 1925 season.

Care has been taken to avoid overplanting this station plot, for the writer believes that there is much landscape value in broad spaces of well-kept lawns. It is indeed very easy to encroach on the beauty of lawns by introducing too many plantings, and it is an error which is often made in the treatment of small plots.

The designers of the Deering High School are the Boston firm of Thomas M. James Company and John P. Thomas, associated local architect; and the designers of the Central Station are Miller and Mayo, architects of Portland.

The city of Portland is now under the council-manager form of government, and under the present charter the members of the City Council are, as well, the Park Commissioners of the city.

Fits or Misfits

There is observable in a number of directions a tendency to build city and town halls on sites too small and badly located for the purpose. Land is expensive. It is well, however, to keep in mind the future and its needs and the general effect of a proper versus and improper development. The selection of a site is just as important as the matter of the building. The tendency is rather in the direction of doing things which will ultimately be regretted.

—Bulletin of the Massachusetts Federation of Planning Boards.

Diesel-Engine-operated Municipal Water-Works---Part I

By Robert V. Cook

DURING the last four years it has been the author's privilege to visit hundreds of water-works throughout the Great Lakes section, affording him an opportunity to study the types of installations now in use, their condition and their economy, and the changes which are being made in various types of installations. This study makes it possible to give a reasonable answer to such questions as: How are diesel engines applied to water-works? Are they usually mechanically or electrically connected to the pump? Are they used for the main source of power or for standby service?

Typical Diesel-Engine-operated Municipal Water-Works

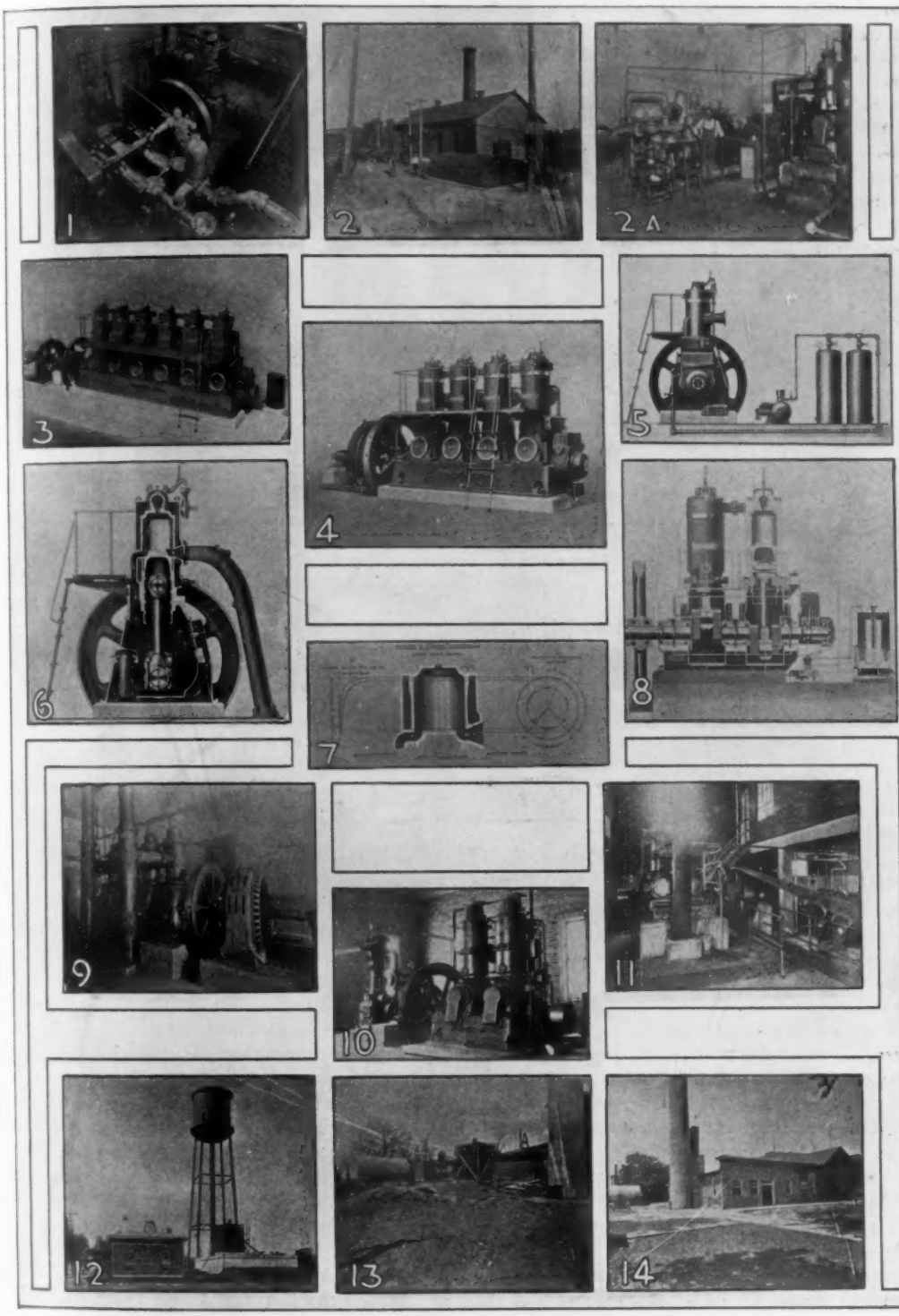
In Chariton, Iowa, Spring Valley, Ill., and Decorah, Iowa, water is obtained from springs, flowing wells, lakes, or rivers, is not filtered and the power pumps are direct-connected to diesel engines. In Marion, Iowa, and La Porte, Ind., the centrifugal pumps are direct-connected to the engine through step-up gears or are belted to the engines. In Quincy, Mich., generator sets are used operating the motor-driven pumps. In Galva, Ill., Polo, Ill., Dodgeville, Wis., and Fond du Lac, Wis., where the water is secured from wells by air-lift the compressor is direct-connected to the engine, and the booster pump is belted. The air-lift installation in Elkhorn, Wis., has the compressor belted to one engine, and the booster pump belted to another engine. Neenah, Wis., an air-lift installation, has the generator sets operating the motor-driven compressor and the motor-driven booster pump. In Brookfield, Ill., where the water is lifted from wells by deep-well turbines, the turbine is belted to the engine, and the booster pumps are belted to a separate engine. A similar deep-well installation in Taylorville, Ill., has generator sets operating the motor-driven turbine and booster pumps. In Perry, Iowa, the water is taken from the wells by power heads, the generator sets driving the motor-driven heads and boosters.

In the following plants water is taken from rivers or lakes through filter plants. In Charleston, Ill., and Portage, Wis., the generator set operates the motor-driven primary and secondary pumps.

Figure 1 shows the plant at Chariton, Iowa, where the engine is direct-connected to the power pump, and the unit is placed in a pit so that the pump is within suction distance of the water in the well, and one handling of water is all that is necessary. This is a very economical set, because direct connection means no transmission loss. It is typical of that portion of Iowa where it is located.

Figure 2 shows the pump-station at Spring Valley, Ill. It is readily seen by the old steam boilers which are laid outside and the old steam pumps which have been torn up that a transformation is under way. Figure 2a shows the inside of this plant with power pump direct-connected to a diesel engine. Flowing wells discharge into a reservoir located under the pump-room floor. The maximum suction lift is only 9 feet, which is a favorable condition. An electric-driven centrifugal pump is used for a standby. The power pump shown is for general and fire service. It is to the advantage of the power pump that it can be used for both general service pressure and fire pressure without a change of speed. In making the installation, the engine is figured of large enough brake horse-power to operate the pump when working under fire pressure. A relief valve is set slightly above general service pressure, protecting the pump. This valve is hand-closed in case of fire.

Occasionally, diesel engines are directly connected to centrifugal pumps The speeds of the two units, however, are such that step-up gearing is necessary. Several such installations have been made recently; for instance, that at La Porte, Ind. Such outfits work very nicely when service conditions are favorable. The step-up gear used is of the enclosed herring-bone type; in fact, it is simply the orthodox steam turbine step-down gear reversed. Such gears have been refined and perfected in steam turbine practice and they are a work of art and credit to the engineering profession. A transmission efficiency of 98 per cent is commonly guaranteed by the manufacturers, and the gears operate without trouble for long periods of time. Usually a gear of the same size that would be used on an electric motor of the same horse-



DIESEL ENGINE PLANT PICTURES DESCRIBED IN THE TEXT

power as the diesel engine is mounted on an extended bed-plate with the pump. The high-speed end of the gear is connected thereto through a flexible coupling. The gear and pump look like a motor-driven set. The low-speed end of the gear is connected through flexible couplings to the diesel engine crank-shaft. Because modern diesel engines are provided with a speed-regulating device which can be adjusted during operation, the speed of such a set, and consequently the capacity and head obtained, can be varied easily. This means that the set can be operated at a low speed for general service pressures and capacities and at higher speed for fire pressure and capacity. The gears usually have a ratio of about 1 to 5, so that changing the engine speed by 50 r.p.m. would change the pumping speed 250 r.p.m., which would result in considerably higher capacity and pressure. This illustrates the flexibility of the set. They are economical in operation, and easily placed in buildings, because all of the equipment is in one straight line. This type of outfit is becoming increasingly popular.

In both the Chariton, Iowa, and the Spring Valley plants the engine used is of the single-cylinder type.

(This article will be continued in the October issue)

For a Working Partnership of Police and Public in Traffic Regulation

By Sidney J. Williams

Director, Public Safety Division, National Safety Council

Organizing Public Opinion

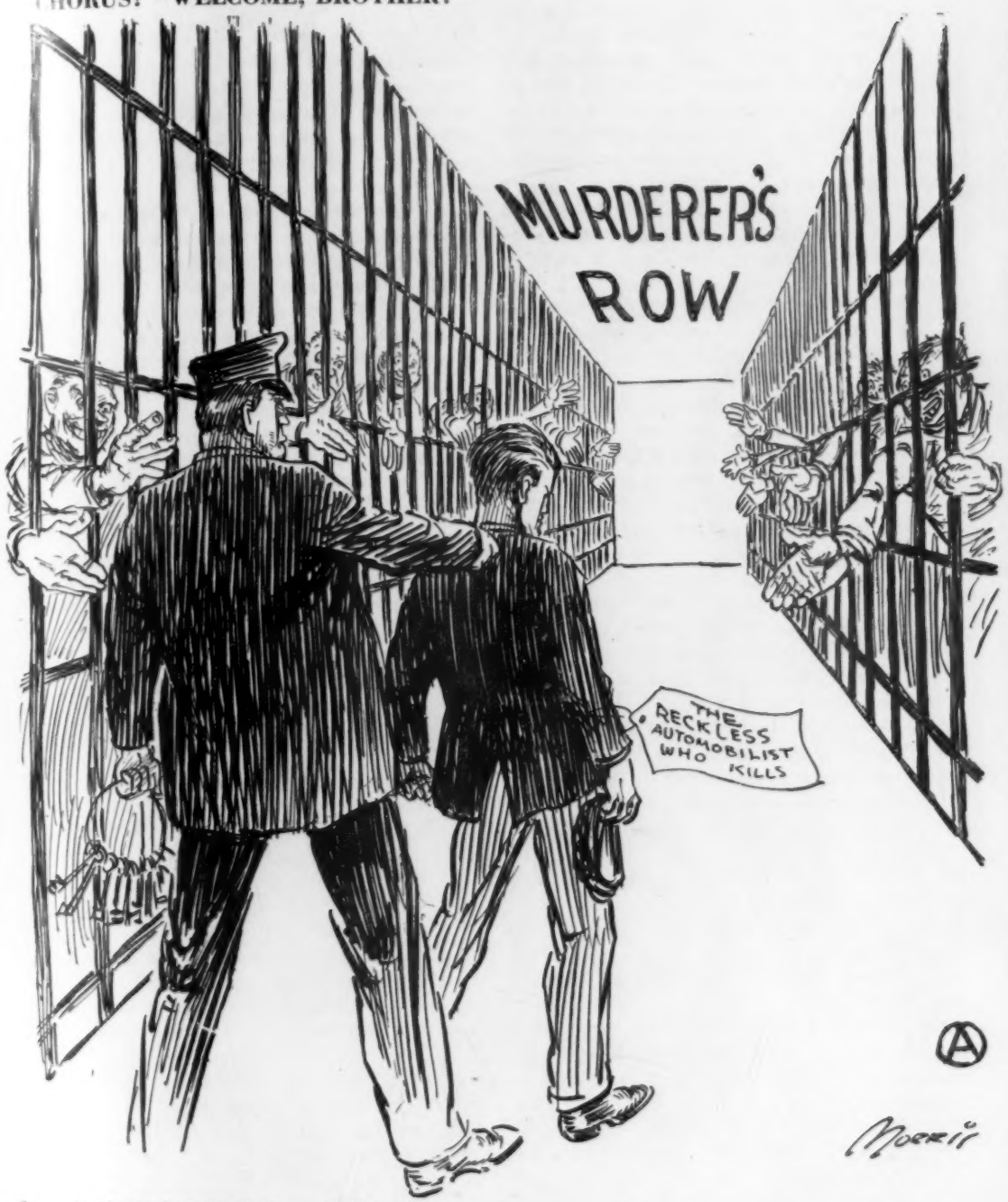
The accompanying paragraphs are from an address delivered before the Annual Convention of the International Association of Chiefs of Police, at Indianapolis, July 15, 1925. Police officials desiring to conduct an organized public safety campaign, such as Mr. Williams suggests, can obtain valuable suggestions by addressing the author at the headquarters of the National Safety Council, 168 North Michigan Avenue, Chicago.

THE automobile furnishes a perfect example of the principle that in our complicated modern life the pleasure and the selfish desire of the individual must be subordinated to the general welfare; that freedom does not mean freedom to injure my neighbor. Take parking, for example. If I were one of a hundred men owning automobiles in the city of Chicago, each of us might park in front of his office all day long without objection. But when I am one of several hundred thousand, it is perfectly obvious that not all of us can do this, and that when a few thousand of us try to do it, we make the streets impassable for the rest. Yet so illogical is the human mind, that many a motorist to-day still cherishes the belief that under the Declaration of Independence he has a perfect right to park wherever he wants to —but that any one else who gets there ahead of him ought to be arrested.

There can never be a "solution" to the parking problem. As long as people want free storage space on the streets, more than there is space available, somebody will be disappointed. We must deal with the problem firmly, always remembering that the streets are primarily for moving traffic and that whenever parking interferes with the moving traffic it must be curtailed, regardless of protests. We must gradually educate the motorist to realize that his free use of the streets for storage is not a right but a privilege, and terminable at any time.

So with speed. Again, if I were one of a hundred motorists in Chicago and all of us were good drivers and there were no horses to be frightened, it might be possible for us to drive 35 miles an hour on certain boulevards without injury or serious inconvenience to any one. But again, in the congestion of vehicles and pedestrians that actually exists, this is quite impossible. We are beginning to accumulate records to show, what most of us have believed although some folks would not admit, that excessive speed is a contributing factor in a great many accidents, perhaps even a majority of all accidents. And, of course, turning a corner into a crowd of people is equally bad. This sort of thing must stop! We and other motorists must rid ourselves of the delusion of grandeur such as afflicted the German Kaiser and his crowd. We must get over thinking that we are the lords of the highway, that the pedestrian must jump when we blow our horn, and that if he

CHORUS: "WELCOME, BROTHER!"



Cartoon by Morris; Protected by George Matthew Adams

Would not the death rate on the streets of your city decrease if the criminally reckless motorists who kill your citizens were classified with the other murderers?

is anything less than 100 per cent watchful and agile it is his fault when we hit him. We must somehow get it into our heads that the pedestrian has as much right to lawful use of the streets as we have, perhaps a little more right at crosswalks. We might even go so far as to recognize that just as we all believe in kindness and consideration for the weak, as we accept without question the principle of "women and children first," so we might give the pedestrian a little more than an even break because he is the weaker and he is the one who gets hurt.

The Traffic Officer and the Pedestrian

I would respectfully suggest that this be impressed upon the minds of all traffic officers—that it is their duty and their responsibility to protect the pedestrian quite as much as to expedite traffic. Some of them recognize this now, but not all. I should like to see, a little more frequently, a curb on the motorist who selfishly crowds onto the crosswalk before he stops, and who then, when the signal changes in his favor, jumps forward like a shot out of a gun at the pedestrian just midway of the crossing, or who turns a corner at high speed honking his horn at the frightened pedestrians who scatter before him. I should like a little more frequently to see this fellow ordered back by the traffic officer, given a lecture on decent manners, and left there for five minuts to think it over. If pedestrians are given more consideration at intersections, both by drivers and by traffic officers, there will be less jay-walking.

For this protection we must look first to the Police Department. That is your job; and if you do not do it, it will not be done at all. No safety council or committee, no automobile club or chamber of commerce, can do it for you, even if they wanted to. Yet, strangely enough, when you try to do your duty, we reputable citizens do not always back you up. If one of us is arrested, he tries by all manner of means to get out of it, and if he does get out of it, he brags about it at his office and at his golf club. And we listen to him and let him feel what a smart fellow he is—instead of telling him plainly that he ought to be fired from his job and expelled from his golf club because he is in the same class with the gunman who saws his way out of jail. We all think of laws as something for the other fellow to obey, and this is especially true of automobile laws, because so many of the violators are men of high business and social standing.

Public Opinion and Law Enforcement

This is a mighty serious problem—the failure of public opinion to support law enforcement by the police. One result, often, is a lamentable failure of the courts to uphold the police because the courts are—and I rather think they should be—quite keenly responsive to public opinion; for, after all, this is more or less of a free country and no public official can for very long do anything that the public does not want.

What is the answer? Is there any answer? I believe there is just one—there must be a definite, continuous, energetic effort to organize and mobilize and mold public opinion to support those police departments and those courts that are doing their duty, and to stimulate those that are not. You may dislike the word "organize" in this connection; you may feel that public opinion should spontaneously support you. So it should—but the good things in life don't come that way. The automobile itself is the product of the highest type of organized invention, production, and sales. Your bootleggers and your gunmen are very highly organized. You must have equally effective weapons with which to fight back. You don't expect your patrolmen to fight with bare fists against a thug with an automatic. Then why hesitate to use the equally effective weapons of public support? There is a whole arsenal of them ready for use: the newspapers, the business and trade associations, the luncheon clubs, the churches, the women's clubs, the schools, the theaters, the radio, posters and statistics, appeals to reason and appeals to emotion. These all have their uses, and they must be used skilfully and in proper coordination.

Through-Traffic Highways Authorized in Pennsylvania

AMONG a number of new motor vehicle laws adopted by the 1925 session of the Pennsylvania Legislature was one relating to through-traffic highways. This gives to cities of the first, second, and third class authority to enact ordinances establishing through-traffic highways, upon which no vehicle from a cross-street may enter without coming to a full stop.

New regulations as to parking on the highways provide that motor vehicles under no circumstances may park entirely on any part of an improved state highway. This means that all roads must be kept open for the orderly passage of two-way traffic.

Rome, N. Y., Believes in Snow Removal

The Story of a Civic Awakening of Far-Reaching Effect

By William P. Doyle

TEN years ago, or even five, blizzards and heavy snow meant that country people were more or less isolated, and at times entirely shut off for days and weeks from the cities or villages where they did their trading and marketed their produce. Considerable loss of business in the cities resulted, while rural people battled with snow, using shovels, land plows, or home-made scrapers that at best meant days of labor with indifferent results.

Then came the time when most of the farmers owned autos, and used light trucks for marketing. If their business was to be a year-'round certainty, the roads must be kept open, and city interests had to come to the aid of the rural people. The initiative must be in the cities. The farmers were almost helpless.

Four winters ago, Rome, N. Y., located in the heart of the snow belt of the state, with a population of nearly 30,000, decided that something must be done to keep the highways leading from the city in all directions open for auto traffic. The Rome Chamber of Commerce took up the work in a determined manner. A committee was appointed with E. J. Karlen as chairman. The Automobile Club of Rome and the Auto Dealers' Association also were enlisted in the work. This united force wanted to prove that keeping the highways open was feasible, so that the County Board of Supervisors might be induced to take up the project as a county matter.

The results have exceeded the most sanguine hopes. Not only have the county legislators been convinced, but, as the result of an enthusiastic meeting of leading citizens from all parts of the county, the state has been asked to make the work of snow removal on all the important highways a matter for the attention of the Division of Maintenance and Repair of the State Highway Department It is the expectation of the projectors of the plan that it may be in operation before another winter, and all this is to result largely from the movement started in Rome four years ago.

The first thing the Chamber of Commerce had to do was finance their plans. All In-

THE SARGENT PLOW AND CATERPILLAR TRACTOR WITH ROY O. SCOVILLE, THEIR OWNER, WHICH WERE EMPLOYED BY THE CHAMBER OF COMMERCE OF ROME, N. Y., TO KEEP THE ROADS SERVING ROME OPEN FOR TRAFFIC

terested citizens were asked to pledge a definite amount, payable in four installments, as needed, no one call ever to exceed one-fourth of the total pledge. There was little trouble getting what was then considered a necessary sum. The first winter horses were used to draw the plows that opened the roads, and $1,200 was spent.

The first winter's work proved the project possible, but mechanical equipment must be obtained, and more money secured.

To buy a tractor and a plow seemed a big expenditure, especially as it could be used only about four months in the year, remaining idle the rest of the time. Then Roy O. Scoville's plan to buy the equipment and work for the Chamber of Commerce and allied interests was accepted. He made a careful investigation of the merits of the various machinery on the market, finally buying a powerful 5-ton Caterpillar tractor and a Sargent plow, made for use with this tractor, and a product of the Union Iron Works of Bangor, Maine.

He has since operated this equipment, furnishing his own help, for $5 an hour, and his work has been eminently satisfactory. Excellent results have been obtained. Each season the work has become more complete and the distance over which it was done has been extended, until this winter $3,200 was needed, two-thirds of which was borne by the Chamber of Commerce and the rest by the cooperating interests.

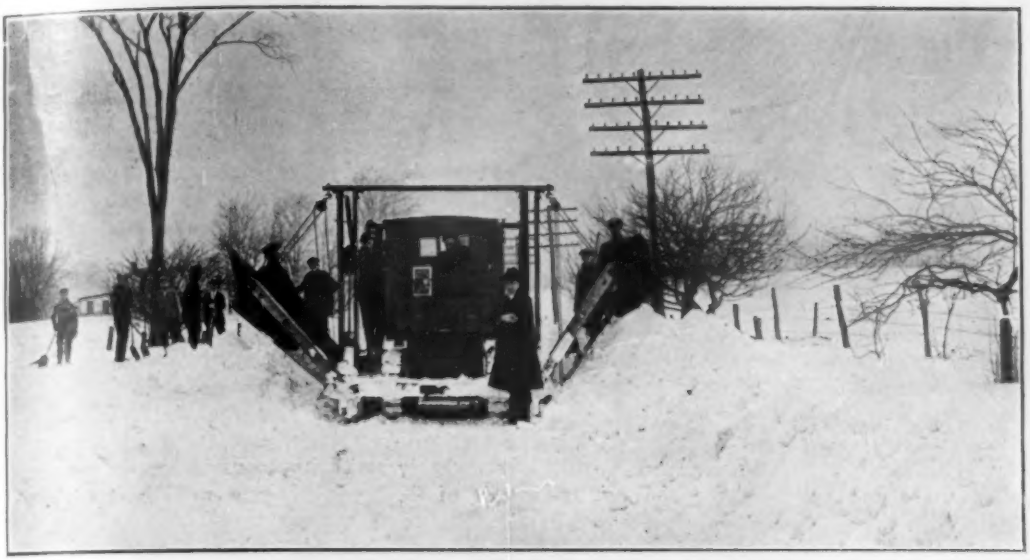
Farmers living on the lateral roads and along the highways that were kept open were invited to contribute, but the first year or two found them indifferent, if not hostile, to the work. They said the roads were scraped so close that the first thaw made them bare and unfit for horsedrawn bobs and sleighs. That complaint then was somewhat justified, but as the use of trucks and autos became more general among the farmers they changed their opinion and now they are the most enthusiastic supporters.

In snow removal much more can be accomplished when the snow first falls, before it has been settled by the sun and wind. When it is light and two to three feet deep, Mr. Scoville plows a track 12 feet wide, and several miles an hour can be completed. The plow is V-shaped and throws the snow back from the center. The further back it is thrown, the easier it is to cope with succeeding falls of snow, because the shoulders, when kept back, permit a place for the deposits of subsequent falls. Once packing occurs, the tractor and plow have to plane the top, going over the road two or three times to get it down hard enough for good auto traffic.

The trouble that follows failure to keep the roads free of snow when it is light was demonstrated here this winter when it cost $300 to open four miles of road from Rome north to Delta Dam. It took 30 hours. The cost would not have exceeded $30 had it been done when the snow was light.

About the first of January Mr. Scoville, seeing that his 5-ton equipment, excellent in its way, might not be powerful enough to battle with an unusual blizzard, ordered and

PLANING THE SNOW WHEN TOO DEEP AND HARD TO PLOW THROUGH ON ONE TRIP



THE FINISHED JOB LEAVING A WIDE ROAD WITH GOOD SURFACE FOR TRAFFIC

had delivered a 10-ton equipment of the same make of machinery he was using. This forethought and forearming proved most providential, because when the unprecedented blizzard of the latter part of January came, he was exceptionally well equipped to handle the heavy task imposed. His new tractor consumes 90 gallons of gasoline in 10 hours, in heavy work, and he charges $10 an hour—and earns the money.

With this giant he can tear through drifts 5 and 6 feet deep, and a lay of 4 to 5 feet on the level can be opened as fast as he can work in lesser depths with his 5-ton tractor and plow. With the two plows he is now prepared for the worst snowfalls that are at all likely ever to block local highways. Of course, in deep cuts, where the snow piles deeper than on the open highways, some shoveling must be done, but after a little hand work he uses the big plow to finish the job.

This winter Mr. Scoville's work was to keep open these roads: Rome to Camden, 18 miles; to Oneida, 14 miles; 18 miles of the 25 to Boonville, Boonville opening the other 7; east toward Utica, 10 miles; 10 miles on the Lowell road; from Rome through New London to Durhamville, 18 miles; 5 miles to Stokes, and on to Lee Center, 5 miles more. This means that every piece of improved road out of Rome was kept open at an expense of $3,200, but when it is known that the trade for Rome which this work made possible means thousands of dollars, to say nothing of the conveniences to the people, the advantage of being able to get doctors and help in sickness, and the continuation of business, snow removal is cheap.

Utica, fifteen miles from Rome, and four times as large, did practically nothing to keep country roads open, and as a result saw some of its rural trade diverted to Rome, especially the trade from Boonville and vicinity. Utica now has plans for following Rome's example, and many other cities are making similar plans.

Rome's work of opening the roads for her neighbors proved a municipal blessing when the big snowfall and blizzard of the latter part of January came, burying everything under four to five feet of snow.

At that time the 5-ton tractor was in Boonville, and that enterprising village commandeered it for two or three days to open the village streets. At the same time the 10-ton tractor and plow were in this city, and Mayor Fred L. Martin temporarily took over the use of the equipment. With the city streets blockaded, the street-car service hopelessly tied up, and a fire menace facing the city, as all the fire-fighting apparatus is motorized, it was of extreme importance that the municipality's interests be cared for ahead of the country roads. The Chamber of Commerce and other interests heartily concurred.

The street to the New York Central station, a mile from the center of the city, was first opened. Then a road was made around and between all the industrial plants, and after that the street-car lines and the main streets were opened. Two days after the great blizzard, the 10-ton equipment was returned

to country-road use, and a new 5-ton Holt tractor and Sargent plow, which had been ordered for the city, under the advice of E. J. Karlen, chairman of the Snow Removal Committee of the Chamber of Commerce, was ready for delivery in Utica, 15 miles away. The tractor and plow were driven to Rome, breaking the great drifts, taking twelve arduous hours for the trip. Much of the way they had to break through roads over which no traffic had passed. It was a severe test for the new machinery, but it stood the strain, and the city officials were more than sure that they had made a wise investment. At times they encountered drifts 6 feet high and had to do some shoveling to keep the plow from burying itself. Had the machinery broken down in that deep snow, some distance from houses, the men would have faced an unpleasant situation. That trip and the work of the tractor afterward convinced the city that nothing larger than a 5-ton equipment would ever be necessary for city use.

After the city streets were opened and the sidewalks were shoveled, piles of snow 6 to 10 feet high lined the streets. To load that snow on to bob-sleighs to be drawn away, a clam-shell Universal Crane, made by the Universal Crane Company, of Elyria, Ohio, and owned by the Water and Sewer Department of Rome, was used. It was mounted on a 5-ton truck, and city officials estimated that 15,500 cubic yards of snow were removed, 90 per cent of which was loaded with the crane, using a ⅝-yard clam-shell bucket. The crane was bought for ditch digging but worked all right in the snow, at a cost of about $20 a day, and did as much work as could be hired done by manual methods for $100 a day

The removal of snow following the big blizzard and the lesser one that followed a couple of days later, cost the city $2,950, a remarkably small sum considering the magnitude of the work. It was possible at such a low figure only because of the mechanical equipment available when the emergency arose, and because all political differences were laid aside, every one working for the common good of the city and surrounding territory.

Care of Concrete-Lined Reservoirs

By R. E. McDonnell

Burns & McDonnell Engineering Company, Kansas City, Mo.

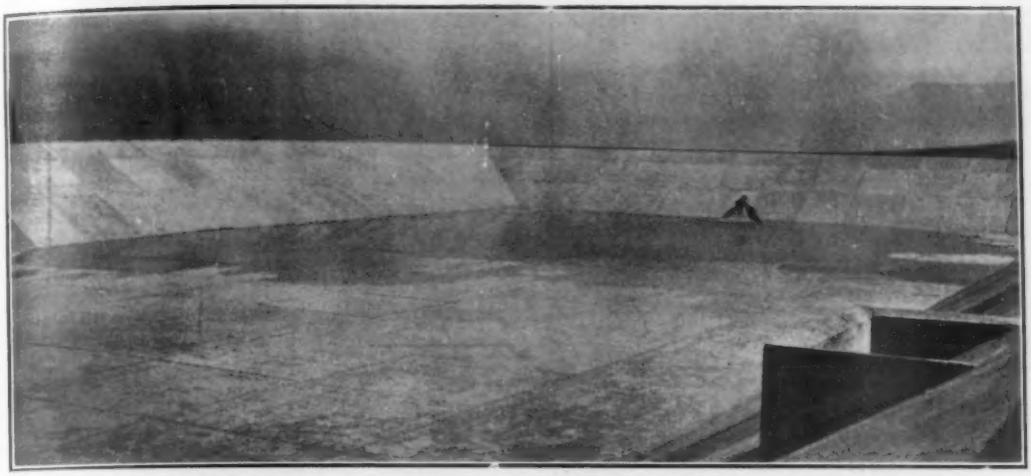
RESERVE storage reservoirs are usually located at high points, remote from the towns and often at inaccessible spots, all of which tends to prevent their observation and inspection. Because of their elevation above the city, there is added, in case of accident, the danger to lives and property, which is all the more reason for their frequent inspection and repair.

A reserve storage capacity of about three times the average daily water consumption is advisable, regardless of whether the supply is from wells, streams, or lakes, or whether the water is pumped or from a gravity source. To store this volume of water above the city is a safety precaution needed to tide over breaks in flow lines, breakdowns in pumping equipment, storm-swept transmission lines, power-house fires, fuel-delivery interruptions, floods, and the many other accidents that are constantly occurring. A sprinkler system installed in mercantile buildings and factories is well recognized as a valuable added precaution, and yet its chief value to the owner would be lost if it were not for the frequent inspections. Lives and protection of property are so dependent upon the reserve water-supply that it is surprising how little care and inspection are given to reservoirs, with the result that breakages are constantly occurring.

It is almost impossible to construct a large earthen reservoir lined with concrete and not have leakage. Earthen banks will settle, and tests made show that settlements will occur fully two years after completion, even if the embankment is carefully deposited in layers, wet down, and rolled. The best and surest way to avoid leakage is: First, a careful study and test of the soil and material used in the construction; Second, a design and plans utilizing the best recognized engineering skill and experience with an ample factor of safety; Third, inspection of the most rigid character.

After complying with all three of these requirements and getting a structure as nearly perfect as possible, it still remains a fact that many reservoirs will leak, and small leaks neglected soon prove serious.

Many methods of waterproofing have been used with more or less success. The use of double layers of concrete slabs with waterproofing membrane between slabs is proving quite satisfactory, with the top slab serving as a protection to the membrane. Gunite has



TYPICAL CONCRETE-LINED RESERVOIR STRUCTURE OF 15,000,000 GALLONS CAPACITY

proved especially satisfactory in repairing old reservoir linings, and now its application upon a wire mesh in newly constructed reservoirs seems to be satisfactory construction.

Inlet, outlet, and overflow pipes are often the source of leaks, and a test of these under the same pressures of operation before they are covered would save many an engineer and contractor much trouble.

An inspection of six reservoirs in as many different states, all of different designs, was made by the writer, and the care, inspection, tests, and observation of the reservoirs, or lack of it, were interesting.

One was inspected almost daily for settlement, leaks, and cracks, and not until eighteen months after beginning the use of it did all settlement cease. Some expansion joints had opened, the curb had lost its perfect alignment, and six months after emptying it and making the repairs no further leakage or cracks have appeared.

One reservoir visited was in such constant use for twelve years that it could not be emptied, and showed considerable increasing leakage, many joints separated, some slipping down of concrete side slabs, and a condition indicating a rather high loss of water. At this place a new reservoir is now being rushed to completion, and a complete overhauling of the old reservoir will then be possible.

One of the reservoirs inspected had been in use a year. All pipes in and out were tightly closed, evaporation was carefully estimated, and after thirty-six hours' standing, no loss of water could be observed.

One reservoir of about fifteen million gallons capacity showed, upon being filled, a seepage through expansion joints and concrete slabs that was considered too high for safety. After a few months' use it was given an interior coat of Gunite, and now, whenever any cracks appear, the water is lowered and repairs are made, the repair materials being kept constantly available. The reservoir now shows, from meter readings and a pipe drainage system, that all leakage has ceased after two years' use.

One reservoir where a break-out of the water did occur (costing about $1,500 for repairs), shows that, for the four months after it had been placed in service, there was a lack of observation, no inspection of possible leaks, and no attention paid to a drop in the recording water-level gage in the pump-station several hours previous to the break. The lack of attention might have been caused by a factional political fight or through a feeling of false security because the contractor had given a bond for the maintenance of the reservoir. The bond doesn't prevent the break, loss of water, and damage to other property, but the contractor did, at his expense, make the repairs.

While writing this article on a train, I've stopped long enough to read the evening paper, and on the front page are accounts of two reservoirs, one collapsing, causing, as the paper states, "No loss of lives, but a washing away of small houses, barns, wooden implements, and furniture, and covering of lawns and streets with mud and débris of all kinds, etc." The other reservoir is mentioned under "Council Proceedings" and states, "The new reservoir on the hill, completed last year, was ordered repaired by the City Engineer, who estimates about $8,000 for labor and materials will be required to place the reservoir in condition for use."

These matters are not pleasant from the

standpoint of the designing engineer, the supervising engineer, the contractor, the city administration, or the public who pay the bills; but when engineers and contractors exercise their best skill and judgment in trying to get a perfect structure, it should by no means be forgotten by the owner, whether he be private or municipal, that these structures should have constant observation, and daily inspection for at least during any period of settlement. They should also be inspected frequently from the standpoint of sanitation as well as to insure their safety.

One unfenced concrete reservoir with sloping sides was visited recently by the writer, accompanied by the superintendent of the water department, and to our surprise we found a cow floating in the water. The cow in trying to get a drink had evidently slipped in. How long the cow had been drowned no one knew, except that the superintendent knew the cow was not there on his last visit about two weeks previously.

I have often visited reservoirs with city officials who were apparently astonished at the algae growth over the water and assured me that it was all new to them, but to an experienced water-works man it showed weeks of neglect.

Every one realizes the necessity of inspection of pumps, filters, machinery, and equipment, but after spending over twenty-five years designing and supervising water-works installations, I'm convinced that reservoirs are the most neglected, yet one of the most vital, features of a good water-works system.

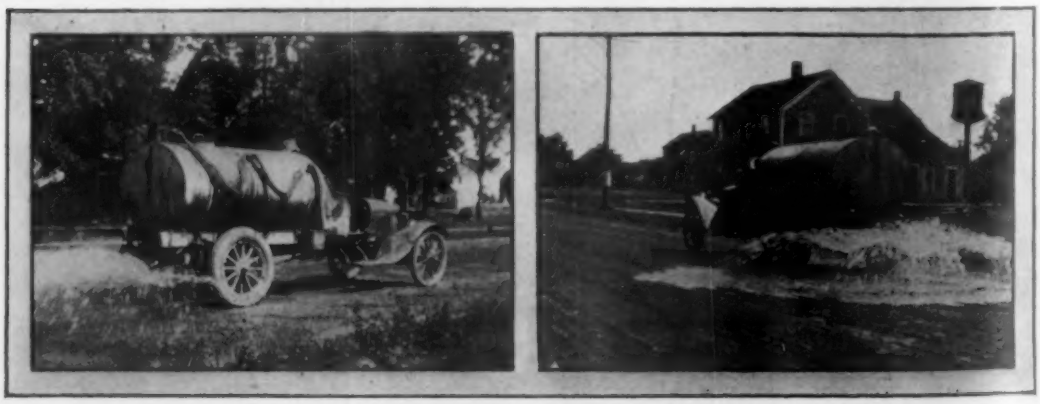
An Economical Sprinkler Outfit for a Small Community

By George W. Harmon
Mayor, Spooner, Wis.

IN the spring of 1924 the horse-drawn sprinkler which had been used for some time in Spooner was in such condition that it could not be used further, and new equipment was considered. There were many suggestions from different members of the Council, so that the matter was taken up with several companies who put out sprinkling outfits. The prices were found to range from $850 to $1,200 for horse-drawn outfits and from $1,250 to $2,300 for motor-truck equipment. The writer, who at that time was a member of the Council, Chairman of the Street Committee, and the Ford dealer for the city, felt certain that more economical equipment could be secured and made an offer of a second-hand Ford truck equipped with a 500-gallon Heil tank for $420. It was agreed that if the outfit did not work, the city need not purchase it, but if it was satisfactory and should need an additional transmission, the cost of which would be $100, the city would buy it. The proposition was accepted and it was put to work about May 10, 1924.

The Heil-Ford sprinkler worked satisfactorily, and after 60 days the Council agreed that the city should purchase it. It handled the work, covering about 15 blocks twice each day in about 2½ to 3 hours, while the old horse-drawn outfit covered only about 10 blocks twice a day and took from 6 to 7 hours for the work.

In 1925 a demand came to the council for



TWO VIEWS OF THE SPOONER, WIS., HEIL-FORD SPRINKLER IN SERVICE

the extension of the sprinkling zone. During the winter the matter was taken up with all property owners, with the result that the territory was extended to cover 52 blocks to be watered once in the morning and again in the afternoon, at a cost of 25 cents per month for each 50-foot lot, to be paid by the property owners, with an additional charge of one-half that rate for corner lots on side streets. This would make the charge 63 cents for a corner lot 50x150.

Because of an unusually dry spring, it was necessary to start sprinkling by the first of April, instead of the first of May, as is usual. The sprinkler has been covering the 52 blocks twice daily, except on rainy days, with satisfactory results. The cost of operation per day is as follows: 5 or 6 gallons of gas and one quart of oil, costing about $1.40 to $1.63, an operator costing $100 per month and incidental charges of less than $5 per month—and the truck now seems to be in better condition than when first started.

The streets of Spooner are quite level so that the truck handles the load on high without any trouble, at a speed of 4 to 5 miles per hour. There are six points in the city where the tank is refilled to save unnecessary travel. For cities where the streets are hilly, it would be necessary to rebuild the transmission. In fact, this would probably be best in any case, but it has not been found really necessary yet in Spooner.

During the first week of operation covering the 52 blocks, the operator kept track of the tank loads distributed and found that the average was 80 loads of 500 gallons each, or a total of about 40,000 gallons per day.

The Mohawk Reservoir and Pump-Station

Interesting Portions of the Spavinaw Water Project for Tulsa, Oklahoma

By A. N. Wardle

Designing Engineer, Holway Engineering Company, Tulsa, Oklahoma

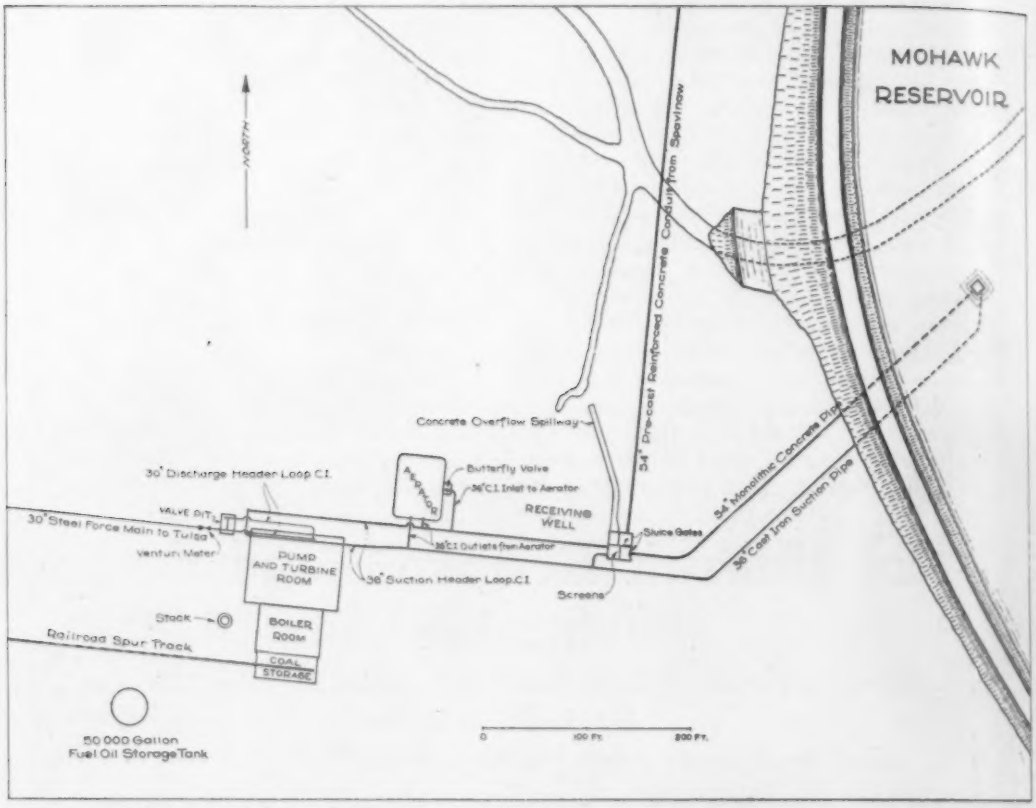
A RECENT construction work of interest not alone to engineers, but to all who are interested in civic improvement and beauty, is the Mohawk reservoir and pump-station at Tulsa, Okla., placed in operation several months ago as a part of that city's 7½-million-dollar Spavinaw Water Project. Aided by a pleasing natural setting at the foot of a gentle rolling slope, buildings and grounds were designed and laid out with an eye to beauty as well as utility.

The Spavinaw Project consisted in impounding a mountain supply near the eastern border of the state and bringing the water by gravity through precast reinforced concrete pipe 55 miles to Mohawk, from which point it is pumped the remaining 4 miles to the city's distributing reservoir. Although but 5 miles distant, the Mohawk bottoms are 30 feet below low-water level in the Arkansas River, on whose banks Tulsa is built. It was this fact that made a gravity supply practical, for the dam site at Spavinaw, 60 miles away, is but 10 feet higher than the Arkansas River level.

Mohawk Reservoir is an emergency storage basin holding nearly a half-billion gallons of water, a 45 days' supply at Tulsa's present summer consumption rate. Reservoir and embankment cover 115 acres, and when filled the reservoir has slightly over a hundred acres of water surface. The banks are of earth fill, excavated from within the basin, and lined on their inner slope with a reinforced concrete slab to prevent erosion by the waves, as winds sweeping three thousand feet across the lake develop considerable wave action.

An interesting feature of the reservoir is its location. Taking advantage of the natural basin afforded by Flat Rock Creek, the flow of this stream was diverted by means of a dam and canal, at a point a mile above the reservoir site, and the embankment was built about the old creek bed and bottoms. At the location chosen for the diversion canal, Flat Rock and Bird Creeks approach within a quarter-mile of each other, then diverge to finally meet after four miles of tortuous winding.

Surrounding the reservoir, the city has acquired 2,000 acres of wooded and grassy land which is being made into a municipal park and playground. Boulevards are being laid out and graded. The old winding creek channel is to be converted into lagoons and pools for boating and bathing, fed by the excess clear Spavinaw water overflowing from Mohawk Reservoir. Until Tulsa's water consumption shall materially increase, there will be 15 million gallons daily of this excess water, even in



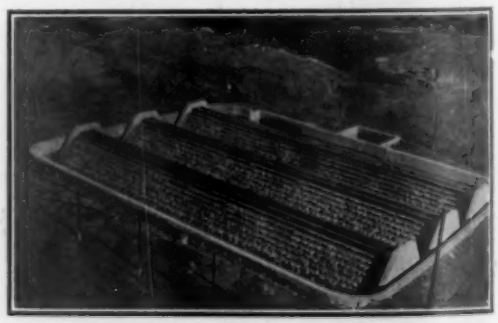
MAP OF MOHAWK RESERVOIR SHOWING LOCATION OF PIPE LINE, RECEIVING WELL, AERATOR AND PUMP-STATION

the hot summer months. Tennis courts, ball fields, a golf course, polo field, bridle-paths, and other facilities for sport and play, should, within five years, make this one of the finest municipal parks in the country. Few, if any, cities of but slightly over 100,000 population, can boast of a 2,000-acre playground.

Located at the western edge of the park, and a short distance from the banks of the reservoir, are the receiving works, aerator, and pump-station, the various appurtenances being characterized by an extreme flexibility of operation.

The 55-mile conduit from Spavinaw terminates in a concrete receiving well or control chamber, approximately 25 feet square and divided into three compartments. Under usual operation, the city's draft flows direct from the receiving well to the aerator and thence to the pumps. The remainder of the conduit flow passes through a 54-inch monolithic concrete pipe and concrete intake tower into Mohawk Reservoir and thence over the reservoir spillway into the park system. Should it be desirable for any reason, as, for example, turbid water at the dam, to change over to the emergency storage at the reservoir, this may be almost instantly done by closing a single sluice-gate in the east-west cross-wall of the receiving well. It will not be necessary to shut the gates at the dam: the flow from Spavinaw will continue uninterrupted to the receiving well, pass over a diverting weir, and spill to waste through a concrete flume into the old creek channel.

The intake tower is a reinforced concrete structure, 6 feet square inside and 27 feet high. Three sluice-gates set at different levels permit



AERATOR AT MOHAWK WORKING AT TWELVE-MILLION-GALLON RATE

water to be drawn from top, bottom, or mid-depth of the reservoir. The elevation of the 54-inch monolithic conduit is such that more than 80 per cent of the available storage can be withdrawn through it. In case of dire emergency, the remaining 20 per cent may be drawn through a 36-inch cast iron line running direct to the pumps. The sluice-gates are operated from the tower top, 3½ feet above reservoir level. By closing the three gates, the entering water may be made to spill through three elevated weir slots, the falling water adding to the attractiveness of the reservoir.

Although all water is screened at the dam, these screens will need cleaning but very infrequently.

The receiving well also houses the chlorinating apparatus for guarding the safety of the supply. There are two machines, of the vacuum solution feed type, with individual connections into each of the three 36-inch cast iron suction lines.

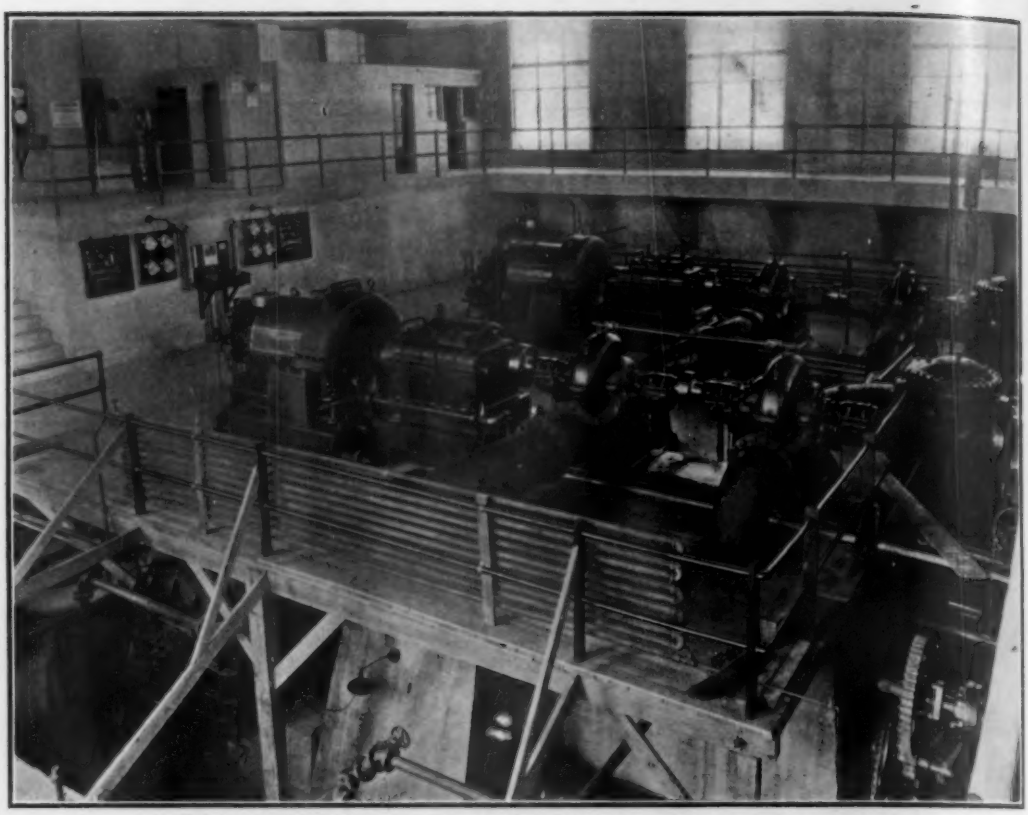
The aerator is of the step type, consisting of three weirs 54 feet long, each with a double series of eight splash steps. The steps are 4¾ inches wide with a 6¼-inch drop. Water enters the aerator from the north 36-inch suction line and, passing through concrete distrib-

MOHAWK RESERVOIR, TULSA, OKLA., BEFORE WATER WAS TURNED IN
At left of reservoir line is the 54-inch conduit entering the receiving well. The pump-station is shown in the foreground and the wooded area of the new park is seen in the distance

mainly to prevent the entrance of fish, additional screening facilities are provided in the receiving well at Mohawk. The screens consist of copper wire mesh on structural steel frames and are made up in units 4 feet seven inches by 5 feet in size, which are easily handled. There are two screen passages in parallel, each 4 feet wide and 18 feet high. In each passage there are three screen slots, the first holding units of ½-inch mesh and the other two, 3/16-inch mesh. The screens may be removed by an overhead crane and hoist, and cleaned by water pressure at a wash sump provided for the purpose. Barring improper screening at the dam, it is anticipated that

uting flumes beneath the weir ways, enters the weir ways proper through 8x12-inch openings spaced on 3-feet 6-inch centers. The water falling over the steps is broken up into a foamy spray and collects in the outer basin, to which is connected the suction header loop to the pumps. A butterfly valve on the aerator inlet line, actuated by a lever arm and float, maintains a constant level in the aerator basin and also shuts off the entering water, should the pumps be shut down.

By looping the suction and discharge headers, the supply is protected against any shut-down due to a break in the station lines. The three pumping units (of which only two



INSTALLATION OF TURBINES AND PUMPS IN MOHAWK PUMP-STATION
Wooden platform in foreground is temporary, pending the setting of the steam reciprocating pump whose foundation is in the immediate foreground

are yet installed) are connected to that wing of the loop within the building and are so valved that a break at any point in the suction or discharge pipe lines cannot place more than one pump unit out of operation. Steam piping, oil supply piping, and other important parts of the units are similarly safeguarded.

The station pump equipment consists of two turbine-driven DeLaval centrifugal pump units, each of 12 million gallons per day capacity, when working against 350-foot head. Each unit has two single-stage pumps in series. A 12-million-gallon Allis horizontal compound pumping-engine now at the old pumping-station on the Arkansas River bank is to be added to this equipment, and a foundation is provided for it. Steam is furnished by two 300 Walsh-Weidner water-tube, cross-drum boilers, which are equipped to be fired by coal, gas, or oil. Tulsa is fortunately situated in the heart of fields for all these fuels. Space is provided within the present station walls for a future additional boiler unit and a third turbine and pump. The stack is of reinforced concrete, 150 feet high and 7 feet 6 inches inside diameter.

A 30-inch steel force main carries the water from the pump-station four miles to the distributing reservoir at Tulsa. This line is made up of hammer-weld pipe with single riveted butt joints in approximately 20-foot lengths.

The pump-station and receiving well superstructures are of pleasing architecture with dark-red mat brick and Bedford cut-stone trim and are surrounded by 2,000 acres of park.

Provision is made in the station and pipe line layouts for a filtration plant, should it prove necessary or desirable in the future.

The station and appurtenances, exclusive of the pumps, boilers, and stack, were built by the E. J. Merkle Contracting Company, of Kansas City, Mo. The stack was erected by the John V. Boland Company, of St. Louis, and the pumps and boilers by their respective makers. The cost of the entire station, appurtenances, and equipment was $377,000. The 4-mile 30-inch steel force main was laid by the H. L. Cannady Company, of Tulsa, at a cost of $244,000. The work was done under the supervision of W. R. Holway, Chief Engineer of the Spavinaw Water Project, with Dabney H. Maury of Chicago as consulting engineer and the writer as Division Engineer.

Code of Colors and Forms for Traffic Signals for Highways and Vehicles

This code is the final draft, released July, 1925, of a code for traffic signals which has been worked out under the auspices of the American Engineering Standards Committee. It has been prepared under the sponsorship of the American Association of State Highway Officials, the National Safety Council, and the Bureau of Standards of the United States Department of Commerce. While this draft is the final report of the committee which formulated it, it has not yet been approved by the three sponsors nor by the American Engineering Standards Committee.

Section 1. Purpose and Scope

RULE 10. PURPOSE:

The purpose of this Code is to provide a standard of colors and methods, as applied to highway traffic and vehicles, which will promote uniform usage and thus decrease the likelihood of accidents, and conserve human life and limb. The approval of specific signs, glasses, or pigments as complying with the specifications herein contained, should be based upon tests made by competent and disinterested organizations having proper facilities and recognized standing, with final appeal to the U. S. Bureau of Standards.

NOTE.—To secure the uniform application of this Code, enforcing officers are urged to consult the committee which formulated it (or the American Engineering Standards Committee, 29 West 39th Street, New York City) regarding matters of interpretation or items of dispute.

RULE 11. SCOPE:

This Code is intended to cover the use of luminous and non-luminous signs and signals in connection with highway traffic, including moving and flashing signals; the use of lights, semaphores, and other signaling devices on vehicles.

Section 2. Vehicle Lights and Signals

RULE 20. HEADLIGHTS:

(a) Headlights shall be white, amber, yellow or any intermediate hue. If electric headlights are used, they shall conform to the Rules Governing the Approval of Electric Headlighting Devices for Motor Vehicles, of the Illuminating Engineering Society (tentative standard of the A.E.S.C., D2).

(b) No red or green lights shall be displayed upon any vehicle so as to be visible from a point directly in front of it.

RULE 21. TAIL-LIGHTS:

Tail-lights shall be red, as seen from the rear.

NOTE.—Red has been adopted on account of its present universal use for this purpose. This use is not considered consistent with the general standardization of colors, and if a change is made in any jurisdiction, yellow is recommended.

RULE 22. WARNING SIGNAL LIGHTS:

(a) Light signals displayed on a vehicle to indicate the driver's intention to reduce speed or change direction should be yellow. They shall not be red or green.

(b) Non-luminous mechanical signals displayed to indicate the driver's intention to reduce speed or change direction shall consist of a semaphore which can be projected from the left side of the vehicle. It is recommended that the position of the semaphore when projected be limited to the horizontal.

RULE 23. MARKER LIGHTS:

Marker lights to indicate the dimension limits of bodies or loads should be located as near the upper left front corner as possible and should be yellow and visible from the front and rear.

Section 3. Highway Traffic Signals—General

RULE 30. SIGNIFICANCE OF COLORS:

(a) *Red* shall be used as an indication to stop and for other purposes where required by law.

NOTE.—The use of red is proper as an indication to stop and to then proceed if conditions are favorable, as for example when "stop and proceed" regulations are in effect.

(b) *Yellow* shall be used as an indication to exercise caution.

NOTE.—Yellow is appropriate when caution is to be exercised without stopping, as for partial street obstruction, so as to reserve red for a stop signal.

(c) *Green* shall be used as an indication to proceed.

RULE 31. SIGNIFICANCE OF FORM:

Where definite forms of luminous or non-luminous signs or signals are used either alone or in combination with colors to give the indications specified in Rule 30, the following will apply:

(a) *"Stop"* shall be indicated by having the greatest dimension horizontal, as with a horizontal semaphore or string of lights.

NOTE.—Where the word STOP is used to direct traffic, it should be in red letters arranged horizontally.

(b) *"Caution"* shall be indicated by having the greatest dimension at an angle of 45 degrees with the horizontal when an inclined semaphore or string of lights is used.

NOTE.—Cautionary signs complying with Rule 33 may be used.

(c) *"Proceed"* shall be indicated by having the greatest dimension vertical, as with a vertical semaphore or string of lights.

NOTE.—Where the word GO is used to direct traffic, it should be in green letters arranged vertically.

RULE 32. SIGNIFICANCE OF FLASHING:

Flashing luminous signals shall conform to the use of colors prescribed in Rule 30.

RULE 33. CAUTIONARY SIGNS FOR DRIVERS:

(a) Highway signs and signals of a cautionary nature for the notice of drivers shall have letters and symbols black on a yellow background or yellow upon a black background.

NOTE.—It is recommended that all cautionary signs have a background of one distinctive shape, and that such shape be reserved for this purpose.

(b) For signs to be read from vehicles in motion, symbols are recommended in place of, or supplementary to, words.

NOTE.—When both symbols and words are used, symbols should be given greater prominence.

(c) When symbols are used, those illustrated in Plate I are recommended for the situations indicated. Other or special symbols should be such as not to be confused with these.

NOTE.—The symbol for the five-point road intersection is to be varied to fit each specific case.

RULE 34. LOCATION OF SIGNS:

(a) Traffic signs shall be erected with the top not more than 8 feet above the surface of the roadway.

(b) Traffic signs shall be erected at the outer edge of the shoulder area and on right-hand side of roadway where practicable.

RULE 35. CAUTIONARY SIGNS FOR PEDESTRIANS:

Signs addressed to pedestrians shall consist of blue letters upon a white background.

Section 4. Signals at Railroad Grade Crossings

RULE 40. ASPECT:

An electrically or mechanically operated signal used for the protection of highway traffic at railroad crossings shall present toward the highway when indicating the approach of a train the appearance of a horizontally swinging red light and/or disk.

NOTE.—This covers the use of so-called wigwags and of alternately flashing red lights, and the use of these devices should be restricted to the purpose of indicating the approach of a train.

RULE 41. LOCATION:

The railroad standard highway crossing sign and the signal shall be mounted on the same post.

RULE 42. OPERATING TIME:

Automatic signal devices for indicating the approach of trains shall be so arranged as to indicate for not less than 20 seconds before the arrival at the crossing of the fastest train operated on the track. Local conditions such as three or more tracks, bad approaches, etc., should be allowed for by increasing the operating time, bearing in mind that too long an operation by slow trains is undesirable.

RULE 43. FLASHING LIGHT TYPE:

(a) *Height.*—The lamps should preferably be not less than 6 feet nor more than 9 feet above the surface of the highway.

(b) *Width.*—The two lamps shall be mounted horizontally 2 feet 6 inches centers.

(c) *Flashes.*—Lights shall flash alternately. The number of flashes of each light per minute shall be 30 minimum, 45 maximum.

(d) *Hoods.*—Lamp units shall be properly hooded.

(e) *Range.*—When lamps are operated at normal voltage, the range, on tangent, shall be at least 300 feet on a clear day, with a bright sun at or near the zenith.

(f) *Spread.*—The beam spread shall be not less than three degrees each side of the axial beam under normal conditions. This beam spread is interpreted to refer to the point at the angle mentioned where the intensity of the beam is 50 per cent of the axial beam under normal conditions.

(g) *Lenses or Roundels.*—The size shall be 5⅜ inches minimum; 8⅜ inches maximum.

RULE 44. WIGWAG TYPE:

(a) *Length of stroke* is the length of chord which subtends the arc, determined by the center of the disk in its extreme positions, and shall be 2 feet 6 inches.

(b) *Disk.*—The disk shall be 20 inches in diameter. Its field shall be white with a black circumferential border one inch wide. The horizontal and vertical diameters shall be shown by black lines 2½ inches wide. A red lens or roundel should be placed at the center in front of the lamp.

(c) *Number of Cycles.*—Movement from one extreme to the other and back constitutes a cycle. The number of cycles per minute shall be 30 minimum, and 45 maximum.

(d) *The lamp,* with which the disk shall be equipped, shall be lighted when the disk is swinging.

RULE 45. APPROACH SIGNAL:

Advance warning signals which indicate approach to a railroad crossing, and not the actual approach of a train, shall conform to the provisions of Section 3, Rule 30.

Section 5. Specifications for Colors

RULE 50. DEFINITION OF COLORS:

Red, yellow, green, and blue as used in this Code are intended to mean:

(a) The colors resulting from the transmission of the proper light through the proper glasses and having the characteristics described in Rules 51 and 52.

(b) The colors resulting from the reflection of white-light from the proper pigments and having the characteristics described in Rule 53.

NOTE.—For a definition of white light reference is made to the report of the Colorimetry Committee of the Optical Society of America, 1920-21 (*Journal* of the Optical Society of America and Review Scientific Inst. 6, p. 563; 1922).

Substantially, it is average sunlight at noon at latitude of Washington.

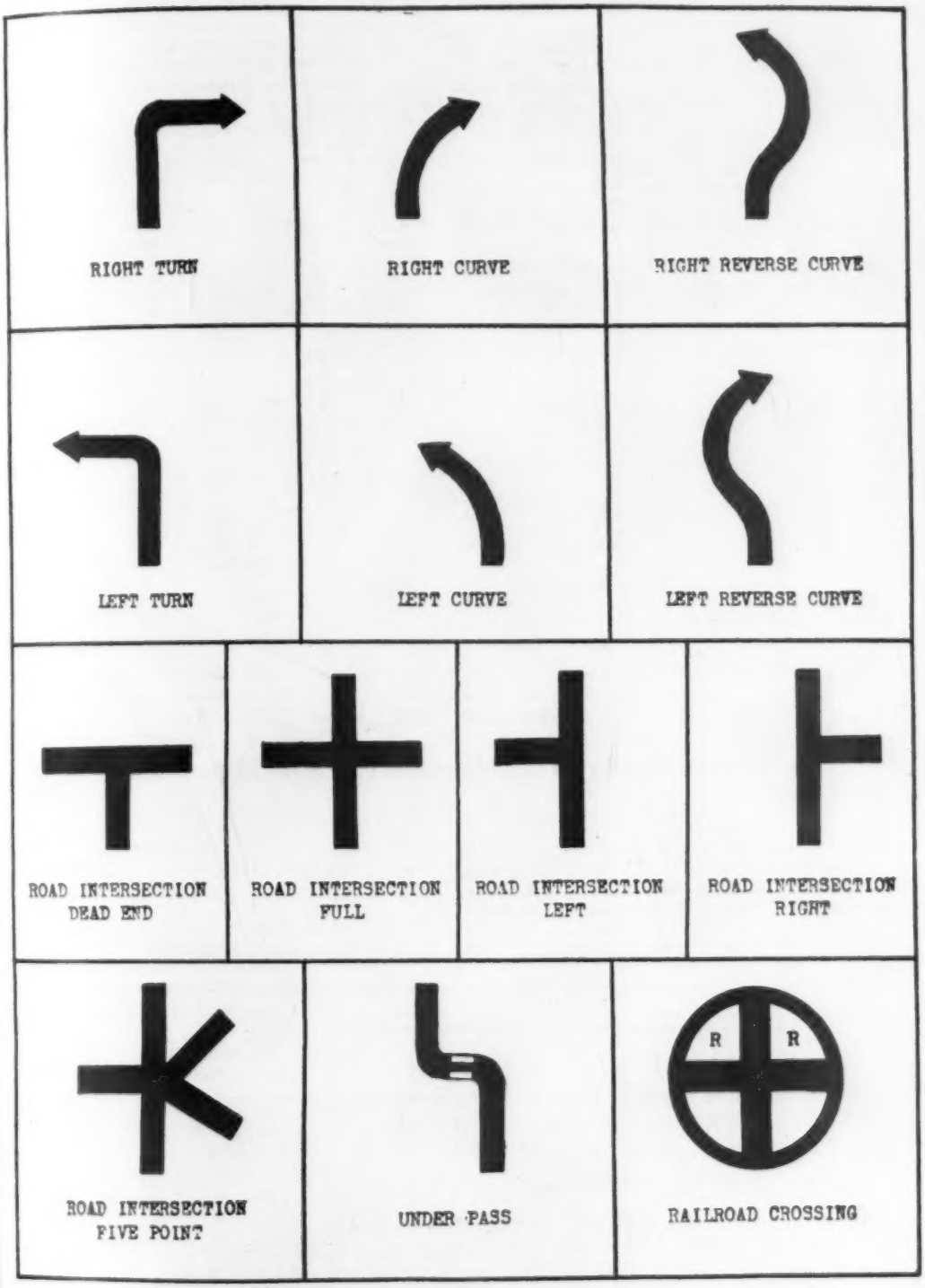


PLATE I

WHEN SYMBOLS ARE USED FOR HIGHWAY SIGNS OF A CAUTIONARY NATURE, THOSE ILLUSTRATED ABOVE ARE RECOMMENDED FOR THE SITUATIONS INDICATED

The symbol for the five-point road intersection is, of course, to be varied to fit each specific case

RULE 51. QUALITATIVE DEFINITION OF COLORS FOR LUMINOUS SIGNALS:

(a) *Red.*—The spectrum of red shall contain both red and orange but not more than a trace of yellow, and no green, blue or violet. The most desirable hue is entirely free from yellow, which means that the glass does not transmit the yellow light from a sodium flame.

(b) *Yellow.*—The spectrum of yellow shall contain red, yellow and green with but little blue and no violet. The most desirable hue is entirely free from blue and might be designated a light amber.

(c) *Green.*—The spectrum of green shall contain yellow, green, blue, and violet, with only a trace of red and orange. This hue is known as "admiralty green," and has a bluish tint when observed by daylight.

RULE 52. QUANTITATIVE DEFINITION OF COLORS FOR LUMINOUS SIGNALS:

The colors red, yellow, and green shall have the following characteristics:

	Dominant Wave-Length in Millimicrons	Purity	Integral Transmission of Glass
Red	not less than 624	not less than 100%	not less than 10%
Yellow	not less than 592 nor more than 600	not less than 97%	not less than 24%
Green	not less than 496 nor more than 536	not less than 45%	not less than 11%

These values are determined by the transmission of light from a source at the color temperature of 2360° K. (practically that of the acetylene flame or present type of vacuum tungsten lamp at normal voltage) through the respective glasses. They are based upon spectral transmission measurements and upon computations carried out in accordance with the methods and data described in the Colorimetry Report of the Optical Society of America.

NOTE.—The light and dark limits of the glasses on which the above values are based have the following relative transmissions on the scale of the American Railway Association:

	Light Limit	Dark Limit
Red	300	150
Yellow	200	100
Green	250	100

RULE 53. QUANTITATIVE DEFINITION OF COLORS FOR NON-LUMINOUS SIGNS:

The colors red, yellow, green and blue shall have the following characteristics:

	Dominant Wave-Length in Millimicrons	Purity	Integral Reflection of Pigment
Red	not less than 608	not less than 60%	not less than 8%
Yellow	not less than 580 nor more than 588	not less than 80%	not less than 35%
Green	not less than 524 nor more than 552	not less than 30%	not less than 8%
Blue	not less than 466 nor more than 474	not less than 10%	not less than 4%

These values are determined by the reflection of white light from the respective pigments. They are based upon spectral reflection measurements under conditions of diffuse illumination and upon computations carried out in accordance with the methods and data described in the Colorimetry Report of the Optical Society of America.

Police Cards Warn Jaywalkers and Motorists

AN organized attempt to reform the jaywalker has recently been inaugurated by the Bureau of Public Safety of the New York Police Department. Traffic officers have been supplied with a quantity of 5 x 3-inch cards, the wording of which is here shown, the cards to be handed to persons who risk their lives by crossing streets in the middle of the block or contrary to traffic signals.

A card of somewhat similar style, but of a pinkish hue, is being distributed by the Bureau of Public Safety, with the aid of the members of the uniformed police force, to motorists in New York. This card reads:

THE POLICE WARN YOU!

To avoid blocking the way for the pedestrian when stopping for cross traffic;

To avoid starting before pedestrians who are crossing in front of you can get clear;

To refrain from turning corners quickly, carelessly, or driving too fast.

Pedestrians are urged to use only REGULAR CROSSINGS and to look both ways, but motorists must help protect them.

Last year motors killed 1045 persons in New York City! We must stop this.

DO YOU KNOW YOU ARE GUILTY

OF JAYWALKING—when you cross the streets carelessly?

JAYWALKERS, who cross in the middle of the block; who fail to look, or who are otherwise careless, endanger only themselves.

CROSS ONLY AT CROSSINGS—If Traffic Officer is there wait for his signal.

ALWAYS LOOK LEFT—LOOK RIGHT!
CROSS STREETS CAREFULLY.

BUREAU OF PUBLIC SAFETY, POLICE DEPARTMENT, CITY OF NEW YORK

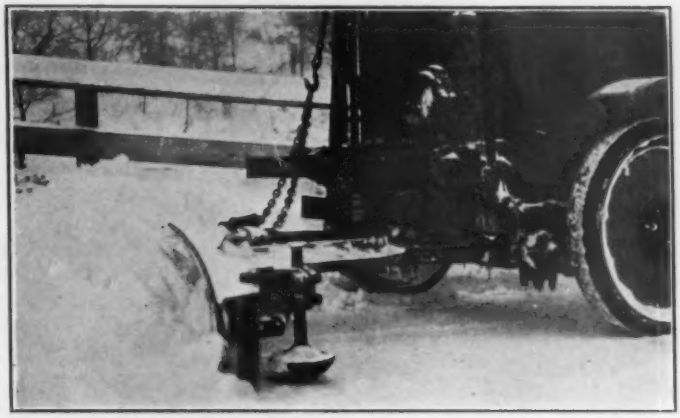
EDITORIAL NOTE.—In addition to these traffic cards, the New York Police Department has recently had the benefit of a series of street-car cards donated by Barron Collier, Special Deputy Police Commissioner in charge of the Bureau of Public Safety, some of which are reproduced on page 280 of this issue.

Snow Removal in West Virginia with Pusher-Type Plows

State Control of Work Makes for Efficiency

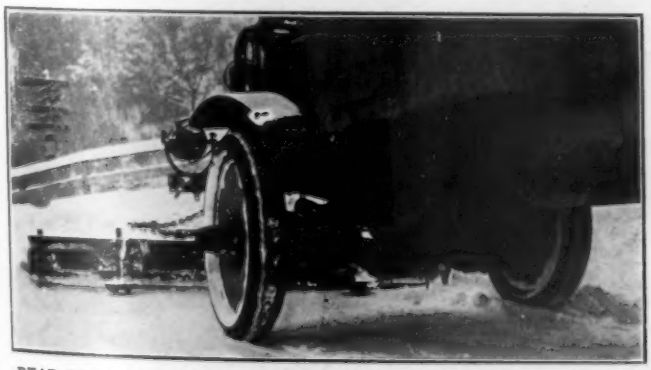
By B. E. Gray
Division Engineer, State Road Commission, Keyser, W. Va.

WITH the growth of truck and bus transportation, it becomes the duty of every highway department to maintain its road system at all times in a condition for the free and uninterrupted flow of traffic. One of the general obstructions to traffic, as well as a factor in increasing the cost of highway maintenance, particularly affecting the northeastern states, is heavy snowfall. The problem of snow removal is especially difficult because of the cost of equipment necessary for this purpose — equipment which may be required only two or three times during the winter. With the rapid increase in state road mileage and the prevalent practice of financing state bond issues from motor vehicle fees and gasoline taxes, the amount of maintenance money is limited, notwithstanding an ever-present need for greater amounts of maintenance work. It accordingly becomes necessary as far as possible to use the same equipment in snow removal that is used in the other maintenance work.



BAKER SNOW-PLOW IN FRONT OF HEAVY AVIATION TRUCK SHOWING HOW SNOW ROLLS UP AND AWAY FROM PLOW

In the northeastern division of West Virginia the State Road Commission guarantees snow removal on about 200 miles of state road, which is divided into 13 maintenance sections averaging 15 miles each. During the winter of 1924-25 there were but three snowfalls, all of which were removed within 24 hours after the cessation of the storm. Types of equipment available in each section were used, and some interesting cost data have been obtained. The cost includes labor, fuel, repairs, and 30 per cent depreciation, but does not include interest on the investment. The state also carries its own insurance. From an analysis of the cost given in the table below, it will be readily seen that the snow-plow attached to the front end of the truck is a most effective and also a most economical proposition. Two types of plows were used, the Baker Mfg. Co. plow and the Champion plow of the Good Roads Machinery Company, giving similar results.



REAR VIEW OF PLOW HANDLING SNOW OF MODERATE DEPTH ON WEST VIRGINIA STATE ROAD

In some of the isolated sections where heavy truck equipment is not needed in the summer, good results have been obtained with a Ford truck, tractor and grader, and, although the cost per mile is somewhat greater than with the heavy truck and snow-plow, in some instances it would not be economical to replace them with

TABLE OF COSTS OF SNOW REMOVAL ON DIVISION NO. 5—WEST VIRGINIA STATE ROAD COMMISSION

No. of Storms	Maintenance Sections	Depth of Snow	Mileage	Equipment Used	No. of Men	Hours of Operation	Total Cost	Cost Per Season	Cost Per Mile Per Storm
4	6–7–8	8–10 in.	60	FWD truck with plow attached	2	90	$220	$3.60	$0.90
1	6–7–8	12" and drifts			3	98	223	3.60	3.60
3	12	8" light	35	HAtruck with plow attached	2	70	160	4.55	1.50
1		12" and drifts			3	40	108	3.00	3.00
3	1–2–3–4 11	6–9 in.	85	Truck and grader 2- and 4-ton and Fordson tractor	3	245	422	5.00	1.70
3	5	6–9 in. heavy show	20	Truck, tractor and "A" frame plow	3	91	222	11.00	3.90
3	13	6–9 in.	30	Fordson tractor with Wehr grader, rubber tires, and chains	2	60	120	4.00	1.35
1					4	30	92	3.10	3.10
5	9–10	8 in.	20	4-horse and 6-horse team and grader	2	125	400	20.00	4.00
1	10				2	55	116	5.80	5.80
Totals	13 Sections	6–12 in., including one drifting storm	250	All kinds			$2083	Av. $8.30	Av. $2.80

heavier equipment that could not be used also during the summer. In the opinion of the writer, the snow problem for the northern states is not yet solved, and undoubtedly some more efficient method will be devised to take care of this work. There is no one thing, however, that more surely commends state control of roads to the traveling public than the prompt removal of snow during the winter months, and every effort should be made, even at a considerable cost, to prevent any blocking of any part of the highway system through this cause.

In West Virginia use is made of the war equipment which was allotted among the states, and in many cases two trucks are used, the first one being equipped with a plow, and the second aiding in pushing by the use of a pole between the two. In one case a 3-ton heavy Aviation truck carried the plow in front and was assisted by a 4-ton Peerless truck in the rear.

Conclusions

The following conclusions have been reached as a result of the experience of the writer: The data as available are insufficient for accurate cost records, but do show the comparisons. The table covers a particular set of local conditions where the snowfall seldom exceeds 10 inches and averages about 8 inches, with a total of five or six storms per season. The high winds with consequent drifting probably increase the cost from 200 to 400 per cent. Each successive storm increases the cost because of the packing of snow at the outer edge of the plowed roadway. This makes it advisable to open up a wider roadway at the beginning of the season. Four-wheel drive trucks are effective because the drive on the front wheel holds the plow steady and a greater speed can be made. With light snows from 6 to 10 inches in depth, a speed as high as 15 miles per hour has been obtained. The full width of the pavement should be cleared, with a minimum of 16 feet.

Snow removal is worth all it costs. First, it provides for all-year-round use of the highways, and, second, it reduces spring maintenance. Graded gravel, shale, and even earth roads should be plowed as well as the pavements, because of the resultant rapid drying out of the surface and greatly reduced spring maintenance.

On heavy-traffic main routes special equipment secured with the main view to speed of clearing is economical and desirable. On other roads where speed is not so essential the regular maintenance equipment is advisable. Plowing should be begun within a short time after the storm is under way and continued until it has ceased.

Street Lighting in San Francisco

ACCORDING to a report made by M. M. O'Shaughnessy, City Engineer, San Francisco, Calif., the next budget allowance for street lighting in San Francisco is approximately $625,000, and $545,825 is paid for maintenance of 14,081 street lamps. This number includes 7,304 electric lights costing $395,503, and 6,107 gas lamps costing $150,321. The report says the price of 2¼ cents for electrical energy used for power purposes and 2¾ cents for electricity for lighting purposes in public buildings seems to be a reasonable figure. In addition to this illumination, the Market Street Railway Company provides street lighting on several streets.

When the report was presented, Supervisor Eugene Schmitz, Chairman of the Lighting Committee, announced that the replacement of gas lamps by electricity was proceeding at a good rate; that in the last year 1,500 gas lamps had been eliminated, and that, according to the lighting survey and plan being made by D'Arcy Ryan, lighting expert of the General Electric Company, San Francisco would within a few years be one of the best-lighted cities in the world. He also reported that the Street Lighting Committee had a surplus of $25,000 left over from the light budget of last year, the savings being made through changes and eliminations.

The City Bridges of London

SOME pious Londoners left a portion of their wealth and estates for the maintenance of London Bridge. These estates became vested in the course of time in the City of London. They are situated not only in the City, but are scattered throughout the metropolis. They have risen in value with the development of London. They are administered on behalf of the Common Council of the City by the Bridge House Estates Committee.

In later times the revenue from these estates became far more than sufficient to rebuild and maintain London Bridge. The City of London has therefore gone to Parliament from time to time for powers to apply these surplus revenues to purchase or rebuild existing bridges and to build new ones.

The Bridge House Estates now bring in a revenue of nearly £200,000. This includes £49,000 from property acquired in connection with the St. Paul's Bridge scheme. If that scheme is carried out and the property pulled down, there would be a corresponding loss of revenue.

The administrative expenses in the year 1923-4 were about £57,000. The cost of maintaining the four bridges in that year was about £36,000, but the annual cost of these bridges averaged over the last five years is £46,000.

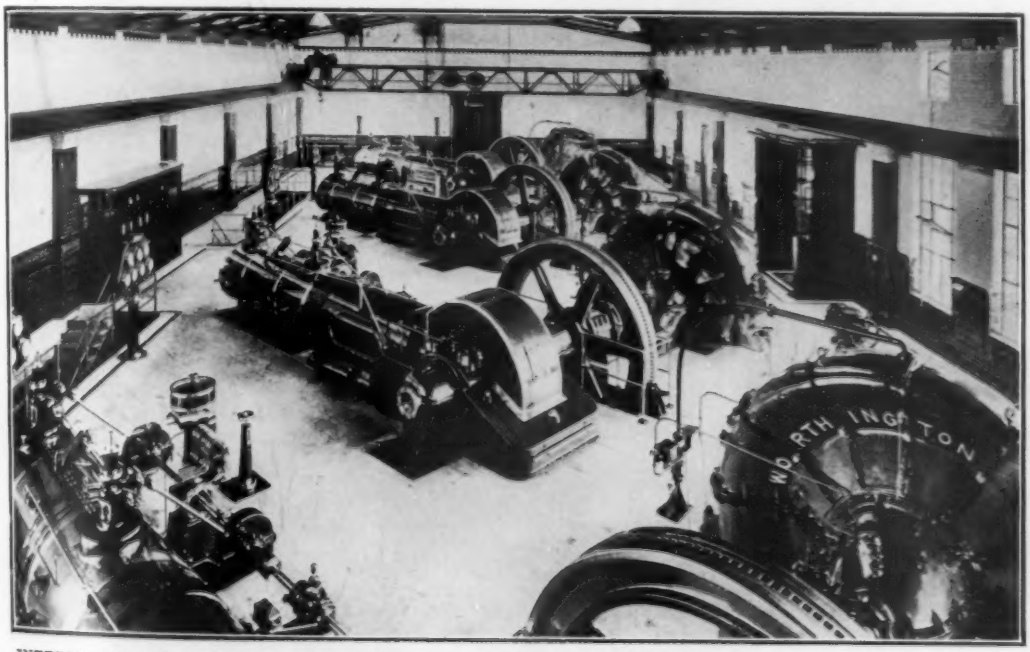
Bulletin—Permanent International Association of Road Congresses.

New Littleton Reservoir of London Water-Supply Placed in Service

THE Littleton Reservoir, which is said to be the largest artificial reservoir in the world, and which will greatly increase the water-supply storage of London, England, was formally opened by King George on June 13. The reservoir is nearly 1¼ miles in diameter and has a water surface of 723 acres. It is capable of holding nearly seven billion gallons of water, or enough to supply every human being in the world with his daily ration of drinking water, leaving a large supply for utilitarian purposes.

The Littleton Reservoir marks an important stage in the great scheme of works undertaken by the Metropolitan Water Board of London to supply that city with an ample quantity of pure water. The reservoir is an irregular seven-sided polygon with rounded corners and is located north of the Thames between Staines and Shepperton, its center being about 2½ miles southeast of Staines. The water is drawn from the river below Penton Hook lock and, after passing through Venturi meters, is conveyed three-quarters of a mile through an open channel to a steam power pumping-station where four Worthington-Simpson horizontal steam engines of the uniflow type, each of 770-horse-power single cylinder, pump the water through steel pipes from the river over the embankments into the reservoir. Low-lift centrifugal pumps were also provided by this firm, which is the English branch of the Worthington Pump & Machinery Corporation, of New York City.

Work was started on the huge reservoir in 1914 and was continued somewhat spasmodically for about eighteen months, progress being delayed by the war. Work was resumed in 1919 and has been carried on steadily since that time.



INTERIOR OF THE LITTLETON RESERVOIR PUMPING-STATION OF LONDON, ENGLAND, WATER-SUPPLY

These steam-driven centrifugal horizontal pumps of 770 horse-power each represent the combined ingenuity of American and English pumping engineers

Applying the Rule of Reason to a Zoning Ordinance

By Hugh E. Lynch

Secretary, City Planning Department, Grand Rapids, Mich.

GRAND RAPIDS has been operating under zoning regulations since March 2, 1923. The ordinance was adopted under authority granted by the State Legislature, providing for a city planning body to draft the ordinance, and another body, the Board of Appeals, to administer it. The success of the Grand Rapids zoning ordinance is due to the hearty cooperation of all branches of the city government having to do with its operation. It was early recognized that zoning was a considerable step forward in municipal regulation of private property and that its future success was largely dependent upon the reasonableness with which it was to be applied.

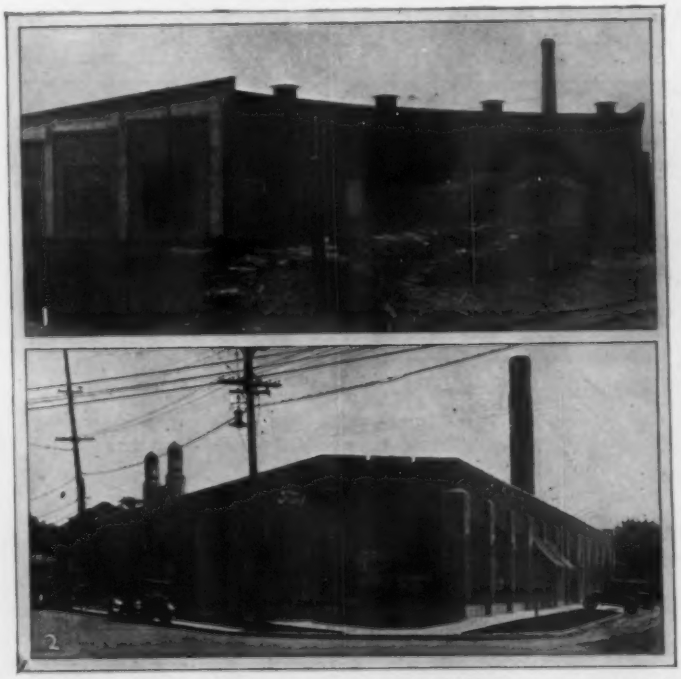
Upon the Board of Appeals falls the responsibility of seeing that all property owners receive "their day in court" with the least possible delay and inconvenience. No zoning ordinance at the time it is drafted can anticipate every possible condition that will arise in its enforcement. Hence, there is a need of some agency to work out these special problems as they arise.

The Grand Rapids Board of Appeals consists of five members who serve without pay and meet semi-monthly. It includes a member of the legislative body of the city who happens to be a manufacturer; a member of the planning department who is an architect; and three other citizens not connected with the city government. One is a building contractor, another a clothing merchant, and the fifth an active president of a building and loan association.

A Smokeless Round-House

While the Board of Appeals has considered some eight hundred applications for variations in the ordinance during the past two and one-half years of its existence, only a very few of these applications were for other than minor variations. The ordinance prohibits railroad round-houses in light industrial districts, although two railroad companies had round-houses in a district zoned as light industrial when the ordinance was adopted. One of these companies had abandoned its round-house and was receiving terminal facilities from the other round-house in this same district. A change in the policy of the railroads called for a resumption of the use of the abandoned round-house and its enlargement. This was contrary to the provisions of the zoning ordinance.

The matter went to the Board of Appeals, and the railroad officials and the people in the adjacent districts were given a hearing. This hearing brought out the fact that the chief objection to the round-house in this district was the smoke nuisance. The Board request-



GRAND RAPIDS USES REASON IN APPLYING ITS ZONING ORDINANCE

1. Smokeless round-house. The slab-wood in the foreground is required by the Smoke Inspector for Smokeless installation. 2. Well-designed sales garage that took the place of an unsightly curling-rink near residences

ed the Smoke Inspector to draw up a set of specifications that would make the round-house smokeless. These specifications were submitted to the people in the community, some of whom were railroad men, and to the railroad officials. The people were satisfied if the smoke could be eliminated, and the railroad agreed to follow the specifications and put in a smokeless installation. The result was a satisfied community, and the railroad company was able to improve its terminal facilities and service. With one of the round-houses smokeless in this district, the Smoke Inspector had a leverage on the other round-house, which was also an old offender, and he used it to advantage.

A Curling Rink Becomes a Garage

Another interesting case was that of a proposed sales and service garage in one of the outlying local business districts. The ordinance provides that the Building Inspector may issue a permit for a garage in such a district when the applicant presents the written consents of 75 per cent of the property owners within 300 feet of the proposed location for the garage. In this case the applicants could secure only 65 per cent of the necessary consents, so that they had to take the matter to the Board of Appeals. The proposed site was occupied by an old frame building used for a few months in the year as a curling rink. The building had been an eyesore in the neighborhood for a number of years, because of its lack of architectural treatment. However, there was considerable opposition to the proposed garage, which was based somewhat on a prejudice against any further commercial developments in this district.

The district was at the intersection of two main arteries of heavy travel and admirably adapted to commercial use. Before the day of heavy motor-car traffic, the property adjacent to this district had been developed by a good class of residences. However, the city had spread beyond this section, with hundreds of new houses. The result was that the residences near the intersection were occupying land that was better adapted and more valuable for commercial use. In fact, there were other proposals that called for the removal of homes from adjacent lots and their development for commercial use. During the hearing the fact was well established that the chief reason for the opposition to the garage was the general opposition to any more commercial developments in that district, even though portions of the district had been zoned as commercial. The applicants for the variation submitted complete contractor's building plans, showing the type of building they desired to place on this property. After considering all the facts in the case, the Board permitted the applicants to proceed in accordance with the plans submitted. To-day the entire community agrees that the garage building is an asset to the district and an improvement over the old curling rink development.

Appeals Which Have Not Been Granted

All appeals for variations in the zoning ordinance have not been granted. In fact, about one-fourth of those presented have been denied. Two appeals denied by the Board have been sustained by a lower court and are now before a higher court on appeal of the defendants. The argument of the defendants in the lower courts was based upon a proviso in the ordinance that is not as clear as it should be. The intent of this proviso was to permit the use of lots of plat record at the date of the passage of the ordinance, even though they did not measure up to the full area requirements of the ordinance, but the wording is such as to leave some doubt in the minds of the average layman. Although the lower court has upheld the decisions of the Board in these cases, the Board has advised that this proviso in the ordinance be made perfectly clear so as to avoid any future misunderstandings. Inasmuch as the cases in court are not serious ones, the Board undoubtedly will recommend that they be dropped after the ordinance has been amended, to prevent any further violations.

In considering appeals from the strict letter of the ordinance the Board has always endeavored to make the ordinance progressive rather than merely prohibitive. Where they could improve and build up backward communities by making slight variations, always properly safeguarded by guarantees from the applicant, they have not hesitated to take the step forward, even though they realized they might be criticized at the time for doing so. The citizens of Grand Rapids are well pleased with the protective features of the zoning ordinance and the fearless, progressive attitude of the Board of Appeals in its administration.

EDITORIAL NOTE.—For another outline of methods by which a zoning ordinance has been successfully administered by a Board of Review without appeal to the courts, see "A Year of Zoning in Providence," in THE AMERICAN CITY for November, 1924, pages 442-444.

Summer and Winter Road Work

WYTHE COUNTY, VA., GRADING OUTFIT, CONSISTING OF A 5-TON CATERPILLAR TRACTOR WITH AN ADAMS GRADER

This outfit was sold to the County Commissioners by the Tractor and Machinery Sales Company, Richmond, Va.

TEAM WORK IN THE USE OF BAKER SNOW PLOWS MOUNTED ON HEAVY-DUTY TRUCKS IN POUGHKEEPSIE, N. Y.

We are indebted to T. F. Lawlor, Superintendent of Public Works, Poughkeepsie, N. Y., for this photograph, taken February 2, 1925

A 10.6 Per Cent Return on Investment in Small Water Plant

By M. P. Hatcher

Burns & McDonnell Engineering Company, Kansas City, Mo.

IN February, 1924, the city of Trenton, Mo., placed in operation a complete new 2,000,000-gallon-per-day gravity filtration plant, together with new intake, low- and high-service pumping-stations and equipment. Prior to this date the city had furnished to a population of 8,000 inhabitants a more or less reliable water service with pumping equipment that should long since have been retired from service. In the last year of operation of the old plant, the continuity of service became quite a problem—the quality of the water a matter of secondary importance. One year's operation of the new plant and equipment has indicated that investment in the improvements has netted a return of over 10 per cent besides improving the quality of the water.

GENERAL VIEW OF PRESENT TRENTON, MO., FILTER PLANT

Former Plant Facilities

The former scheme of operation included a combined low- and high-service pumping-station on the Thompson Fork of Grand River, a 1,200,000-gallon-per day filter plant on the same site and a 65,000,000 gallon raw-water storage reservoir. The stream was very turbid and subject to pollution; during periods of excessive flow a large amount of fine sand was carried in suspension.

The pumping plant might well have been termed "the horrible example." Obsolescence, emergency measures, and makeshift arrangements over a period of twenty or more years had resulted in a very run-down, dilapidated plant. Oil engine, electric motors, and steam were used as sources of power in the operation of the plant. Operation was very uneconomical and maintenance costs excessive Suction was obtained by merely dropping a pipe into the river. Quite often the suction became clogged with sand; at other times fish and débris were pumped to the filter plant.

At the time the improvement program was being planned, the filter plant was but five or six years old and, although slightly neglected, could have been placed in fair operating condition but for other disadvantages. The settling basin capacity was grossly inadequate and difficult of extension. In addition, the plant site was subject to overflow during periods of extreme high water in the river.

Service under these conditions was, of

course, unsatisfactory. In addition to being unreliable and inefficient, the plant was often unable to furnish a palatable water. The filter plant was overtaxed and often out of service. At times it was necessary to pump raw water into the mains.

Plant Improvements

In considering the improvement program, it was hoped that portions of the existing structures and equipment, particularly the filter plant, might be utilized. It was readily agreed that there was nothing of value in the pumping plant, but there was some question as to the advisability of abandoning the filter plant. After considering the matter from the standpoint of saving in first cost, flexibility, efficiency, and reliability of operation, it was felt that the effectiveness of the whole scheme of operation would be impaired by the shortcomings of the existing plant. Rather than jeopardize the success of the improvements, a plan including a new filter plant was approved; the completed improvements have proved the wisdom of this decision.

The new low-service pumping-station and intake were constructed near the old plant, using the same source of supply. The intake scheme is of particular interest. Coarse material and leaves are removed from the water by removable screens in the intake crib on the river bank, to which is connected a circular suction well of 10 feet inside diameter. In this well the water comes practically to rest, causing the fine sand to settle to the bottom of the well. The sand is removed by a water-operated sand eductor when the deposit approaches the elevation of pump suction. Two motor-driven centrifugal pumps of 700 g.p.m. and 1,400 g.p.m. capacity respectively take their suction from this well but are housed in a separate structure.

The new filter and pumping plant is constructed near the 65,000,000-gallon storage reservoir previously mentioned, about a half-mile from the low-service station. Provision is made for pumping from this reservoir during flood periods or other adverse low-service conditions.

The new filter installation consists of four units, three equipped, each having a capacity of 500,000 gallons per day. Provision is made for all piping connections to the unequipped unit. All valves are manually operated. In addition to lower first cost, the manual control has the advantage of simplicity and ruggedness, which, for a plant of this size, is of major importance. Operating tables and automatic equipment are too often neglected in the smaller plants where superintendence is not the best.

The plant is equipped with two chemical dry-feed machines for feeding alum and lime. The mixing chamber is an over-and-under baffle type and is divided into two compartments so that one compartment may be cleaned without cutting the entire plant out of operation. The same idea was extended to the settling basins. The basin capacity is divided, but the two compartments are operated in parallel under normal conditions. The total capacity of the basins allows a six-hour retention period under two-million-gallon-per-day operation. The filtration plant is provided with a clear-water storage of 230,000 gallons capacity.

High-service pumping equipment is placed under the same roof with the filters, thereby localizing the duties of the operator. Filtered water is delivered to the distribution system through three motor-driven centrifugal pumps having the following capacities respectively: 700 g.p.m.; 1,000 g.p.m., and 1,400 g.p.m. Power is furnished by the local electric company.

Special attention was given to the architectural treatment of the plant and landscape treatment of the site on account of the proximity of the place to a much-traveled state highway. Results have indicated that the amount expended for the sake of appearance has been used to excellent advantage.

Reduced Cost of Operation

Now that a full year has elapsed since the new plant was placed in operation, there has been an opportunity to study the costs of operation and maintenance of the new plant as compared to the old. The comparison is made over a period in which only slight changes in prices have occurred. The resulting economy of operation in the new plant is a forceful argument for comprehensive consideration of an improvement program. Cities are often prone to sacrifice a clear-cut scheme of operation for a less efficient plan including old equipment or structures of doubtful value.

The following tabulation compares the cost of one year's operation for both the old and the new plant. The operating period for the old plant is taken from January 1, 1923, to January 1, 1924; for the new plant, from April 1, 1924, to April 1, 1925. The inter-

vening period is one in which both plants were used at times, and is not considered:

	Old Plant	New Plant
Salaries	$6,660	$5,700
Filter plant chemicals	232	1,600
Electricity for power and light	2,230	12,275
Coal	17,895	.....
Oil	1,864	.....
Maintenance	1,563	255
	$30,444	$19,830

A saving of $10,614 in plant operation costs, to say nothing of the improved quality of the water. The small amount of chemicals used in the former scheme indicates the small percentage of the year that the filter plant was in operation. Approximately $100,000 was expended on plant improvements at Trenton—an investment netting a return of 10.6 per cent, besides greatly improving water service.

During the year's operation of the new plant a total of 305,900,000 gallons of water was pumped by the high-service pumps, using a total of 605,140 kw. hrs. With current averaging about 2 cents per kw. hr., pumpage has cost $40 per million gallons. Chemicals delivered to the plant have cost $5.20 per million gallons of water pumped.

The water department at Trenton is controlled by a non-political water board termed a Board of Public Works, and is efficiently managed. The members of this board are: W. E. Patterson, President, W. W Alexander, and W. J. McAdams

The engineers for the improvements were Burns & McDonnell Engineering Company, Kansas City, Mo.

Service Reservoirs and Desirable Pressures for Domestic Service

By A. C. Hutson

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IT is, of course, a prime requisite of municipal water-supply that its pressure be steady and uniform. This implies the taking of precautions to insure unvarying flow under any and all conditions, whether routine or abnormal. As a general rule, the most effective and at the same time least expensive means to overcome the inconveniences attending a sudden increase in draft, is the provision of a service reservoir. Such reservoirs are found in many American cities.

Usually they are located within or just outside the city limits and are connected with the distribution system by separate mains; that is, by lines other than those that carry the regular supply. Thus, fluctuations in demand can be cared for from the storage in the reservoir instead of by effecting a greater flow in the common supply line, for it is seldom possible to have supply mains of such a size that peak demand does not introduce a considerable reduction in pressure. Where these lines are long, this reduction may be serious for extended periods. Obviously, then, service reservoirs which aid in the maintenance of pressure are highly desirable in cities whose water-supply source lies at a considerable distance from the community.

As is the case with other features of waterworks design the question of the use of service reservoirs and that of the pressure to be carried sometimes overlap. They may, indeed, even conflict; and, therefore, the advantages of each must be weighed carefully and a proper balance struck for the particular city and condition concerned. Considerations other than necessary pressures, too, must be regarded, such as the most feasible site for a service reservoir, when two or more locations are available; the size of the mains, the proximity to high-value districts, the cost of power, and the efficient operation of pumping-stations.

A reservoir constructed at a high elevation remote from the center of distribution will provide a higher initial pressure than a reservoir at a lower elevation at a less distance, but under maximum draft the relative value of these pressures may be reversed, as the friction losses in the shorter supply mains may permit a greater sustained pressure from the near-by reservoir than from the one at the higher elevation.

As far as concerns desirable pressures, it is a fact that the demand for good domestic service alone often governs. Many of the

older systems in the country were designed in accordance with this theory, with the result that the pressures adopted were relatively low—far too low for present needs. To-day the trend is towards higher domestic pressures. In the past ten or fifteen years several of the larger municipalities have materially increased their normal pressures, and not only in their business districts, but in outlying sections as well. Notable among these are New York, Newark, Jersey City, Syracuse, Springfield, Mass., Buffalo, Providence, Louisville, and New Orleans.

It is, of course, well recognized to-day that a water system, whether privately or municipally owned, is a public utility and that any failure to provide the public with water at all times is certain to draw complaints and create general dissatisfaction. If this handicap to operation is to be avoided, the water system must furnish an ample supply at pressures sufficient to assure suitable service at all regular elevations, even though excessive peak consumption rates may be reached very infrequently. Assuming, now, that the source of supply, whether gravity or pumped, is ample, it is obvious that the higher the initial pressure, the better will a good domestic pressure be maintained at a satisfactory figure during peak demands. Moreover, a high initial pressure will offset local losses due to partial clogging of service pipes, to excessive lengths of conveyance because of wide streets, and to other conditions of a similar nature.

Some really large cities, such as Chicago and Detroit, have furnished a supply at a low initial pressure for many years, a circumstance from which it might be argued that the absence of general complaint in these cities, and in others wherein pressures average from 20 to 40 pounds, proves that pressures as low as these are suitable for domestic consumption. Yet this is no proof. As in so many other things, so in the matter of water pressures—what the general public knows nothing of, that the general public does not miss. Low pressures, however, do result in forcing owners of high buildings to install special pumping equipment and local water-tanks, if they are to obtain a proper supply, and this "self-service," as it were, is costly. Furthermore, relatively low pressures often necessitate, on the part of the water department, the establishment of "booster" or special high service to take care of elevations above the average or to serve outlying sections where a satisfactory supply cannot be sent when pressures drop 10 or 20 pounds.

It is conceded to-day that one of the essential services performed by a water system is the suppression of fire, and few communities are any longer so blind as to provide a system adequate for domestic purposes only. In point of fact, almost everywhere the first consideration relates to the potential demand for fire protection; this, and the insurance credit to follow the establishment of a good water-supply. Water for domestic purposes usually can be obtained by the individual from wells or cisterns, and the first impetus for a water-works system is generally due to a series of fires, or to the desire of some of the larger property interests to provide protection to their plants.

It is therefore evident that the question of pressures, as well as other features of the design of a water system, cannot be decided solely from the standpoint of domestic service. Probably, in the average small town and, in fact, in any community where few buildings exceed three stories in height, 30 pounds of pressure is ample for domestic service. Yet successful fire combat always entails the concentration of enormous quantities of water about individual buildings, even when the blaze occurs in a residential section. The amount of water so diverted far exceeds any normal domestic draft, and to make it obtainable, either pipe of large size must be laid, or else, if smaller mains are used, pressures must be raised high enough to overcome friction loss. Between these two requirements stands a mean, and this mean affords the ideal condition.

In the past, many cities, particularly those in the West, to which water had to be pumped, attempted to meet the situation by increasing pressures during fire emergencies. This measure, throughout the long period of horse-drawn steam fire-engine, with its high cost of maintenance and operation, was satisfactory enough, since, with pressures at from 90 to 100 pounds, fire companies with hose-wagons could run their lines direct from the hydrants. The modern fire department, however, with its motorized apparatus, uses a pumping-engine instead of a hose-wagon, and this can be purchased at a figure which is hardly prohibitive even to small towns. Times literally without number, automobile pumpers have proved eminently dependable; in fact they far surpass the old steamer in their ability to deliver a large quantity of

water continuously. It is therefore held, nowadays, that the raising of pressure for fire fails to bring an appreciable economic advantage, while it does unquestionably introduce a material element of unreliability. Increase in pressure for emergencies means added stress, and other troubles are sure to follow the change in direction of flow following concentrated draft. This, and the water-ram due to sudden shutting down of hose lines, has resulted, in a number of instances, in broken pipe lines.

The growing height of buildings in America is making it ever more difficult to furnish water direct from the hydrant at pressures which will give satisfactory fire service, unless special fire-mains are laid. To reach throughout structures which are four stories or over in height, a pressure of at least 60 pounds at the hydrant is necessary during such times as the full fire demand is being drawn. With the most advantageous layout of mains, this means a normal pressure exceeding 75 pounds. As the number of buildings of four stories and higher increases, the fire-flow is required at stronger pressures to give satisfactory service, and even then pumper capacity in the fire department must be provided for extreme heights, unless the remaining pressure attains to 150 pounds or above, as in a special fire-main system.

Though the fire department may have equipped all companies with pumping capacity, it nevertheless is true that ability to deliver at least 10 per cent of the required fire-flow direct from hydrants materially increases protection, if the fire apparatus can respond direct to the building and use a chemical stream from the large tank, after laying a line of hose from the hydrant to the fire. With suitable pressures, this line can be used direct from the hydrant to back up the chemical line in case it is not sufficient to extinguish the fire. There is always delay when the fire-engine must be connected to the hydrant before a good stream can be obtained. Therefore, the ideal fire service condition is one where pressures will permit a few hose lines to be used direct from hydrants, and which also will assure a continuously satisfactory flow under the heaviest demands, both domestic and fire, without dropping locally to less than 20 pounds. Twenty pounds is regarded as the minimum to which fire-draft should be allowed to reduce pressures, for at 20 pounds considerable friction loss can be overcome in the hydrant and suction hose and still have a positive pressure and not a vacuum on the pump of the fire-engine.

Value of the Automatic Sprinkler

Outstanding as a feature of modern fire protection in America is the automatic sprinkler. Without its aid the high conflagration hazard prevailing in most of the business districts of the towns and cities of this country cannot be lowered. Buildings of large area and of the high combustibility common to ordinary wooden joist construction cannot be made safe for store or manufacturing occupancy, especially if three stories or higher, except by the installation of automatic sprinklers; the same is also true to a lesser degree of fire-proof buildings if the contents are readily combustible. Mandatory requirements for such installations are embodied in the labor laws of numerous states and cities, and in the past year legislation has been introduced in one of the eastern states for compulsory sprinklering of apartment houses and hospitals.

Recognizing, then, that automatic sprinklers are essential, and that to be of value an ample and dependable water-supply must be provided for them, and further, that for the individual to provide this water-supply in each case the cost would be excessive—in view of all this, it is plain that modern water systems must be so designed as adequately to feed these systems.

Regulations for automatic sprinkler systems state that:

"One or more connections from a reliable public water system of good pressure and adequate capacity furnishes an ideal 'primary supply.' A high static water pressure should not, however, be a criterion by which the efficiency of the supply is determined. The supply from city main should not be considered standard unless a hydrant test of the main capacity with at least 500 gallons a minute flowing indicates sufficient residual underground pressure to give at least 12 pounds under the roof; this requirement of flow is the minimum for equipments having 200 heads or less in one fire area; larger areas will require additional flow in gallons per minute."

Analyzing this stipulation, it is apparent that the minimum pressure permissible, allowing 5 pounds to a story, is for—

	Pounds
2 story buildings	22
3 story buildings	27
4 story buildings	32
5 story buildings	37
6 story buildings	42
7 story buildings	47
10 story buildings	62

To this must be added an allowable drop,

due to the flow in the local mains; for a 6-inch main, 600 feet long and fed both ways, the loss caused by a 500-gallon flow to a central point would be only about 1 pound, indicating that the foregoing figures might be adopted as the needs of the system if sprinklers are to be supplied. But to be of full value, this minimum of 12 pounds on the top line of sprinklers, with a flow of 500 gallons, should be available during periods of maximum consumption draft; an ideal condition would be to have this sprinkler supply available even at a time of heavy fire-draft in an adjacent building. It is not always possible to build a distribution system such as to assure sprinkler supply under all conditions, but, in determining upon the pressure to be carried, it is reasonable to allow a material increase to care for losses due to peak consumption demand, or moderate fire demand, and also to care for a greater flow than this minimum of 500 gallons; this increase should be at least 100 per cent in the average city or town, giving required true static double the pressures indicated above for buildings of various heights.

It is not argued that pressures should be such as to care for all buildings in a community. It is reasonable, however, to provide for a building of normal or average height, which in most cities means four or five stories. It is therefore evident that a normal static pressure of from 60 to 75 pounds is desirable for automatic sprinkler protection; such a pressure will also furnish good first aid hose stream protection from stand-pipes in buildings of four or five stories, and from yard hydrants about manufacturing plants.

Considering all features, it appears that a pressure ranging from 60 to 75 pounds is desirable as the normal static pressure in American cities, since this pressure will:

a. Supply domestic consumption to all except the highest buildings (over 10 stories).

b. Permit considerable fluctuation or lowering of pressure locally during peak demand without leaving extensive sections poorly supplied with water.

c. Insure quicker operation of the fire department, by allowing direct hook-up of hose lines with hydrants.

d. Assure effective sprinkler supply to a building of four or five stories.

e. Enable smaller service pipes to be utilized.

f. Afford more satisfactory flow for manufacturing processes requiring large quantities of water, or use in lawn sprinkling and for other needs.

Many existing water systems are functioning at materially lower pressures than the desirable one of from 60 to 75 pounds. Where supplied by direct pumpage, an increase is readily feasible; in some instances this would mean the cutting out of a stand-pipe or tank, but in a majority of cases these devices are of small capacity and are located near the pumping-station; their main function has been to cushion the pump discharge. The need for them is slight, and they have been abandoned by many cities.

Experiences in Cities Which Have Raised Pressures

Experiences in respect to effect upon house plumbing and fixtures, in various cities where water pressures have been increased, are highly significant. Here is some of the testimony:

In Springfield, Mass., pressures were increased in 1910 from 35 to 135 pounds in the business district, and by the same or a somewhat lower amount throughout the city. Following completion of the readjustment, the Water Commissioner reported for 1910 and 1911 in part as follows:

"Three serious breaks, one in old cement-lined pipe and two in mains and connections recently laid. Including the above, there was a total for the year of 73 leaks in mains and 226 service pipe leaks, with average cost of repairs of $51 and $5, respectively."

"During 1911, thirty-two leaks in mains and 113 in service pipes; average cost per leak $19 and $7.50, respectively. Leaks generally attributable to the increased pressure, which in many cases was where cement-lined or old light-weight pipe had not been removed."

And these are extracts from a statement by Water Registrar Hathaway:

"The lower level, or down-town portion, of Springfield was formerly supplied by the old low-service system, which gave a maximum pressure of about 35 pounds. The large number of old tenement premises were located in this section. At that time the high-service supply from Ludlow gave a maximum pressure of about 135 pounds in this lower portion, but was not used for these tenements because of the old and weak plumbing.

When the supplies were both superseded by the new supply from Little River, with a maximum pressure of about 145 pounds in the down-town section, it became necessary to replace the service pipes for this class of property with new and stronger pipes from the street main to the building. The cost of these services was equitably divided between the property owner and the water department. Pressure regulators were also installed between the new services and the old plumbing, the consumers paying only the actual

cost of same to the department. In this manner, we overcame the objection spoken of, and, the consumers having become accustomed to the new situation, we now have very little trouble."

In Syracuse, N. Y., which increased pressures in 1894 from about 45 to 90 pounds in the business district and similarly elsewhere, the water department states that, while no record of breaks was kept, not more than three or four ruptures could be charged to the increased pressure. Leaks in services and plumbing were too infrequent to be of much concern; troubles were practically over in less than a year. Similar increase in pressure was effected in the districts of Elmwood Avenue and University Hill, early in 1910, by feeding from a new stand-pipe under an increased head of 47 pounds. In the nine months following this change there were four breaks in mains and four service blowouts, and there is considerable doubt as to whether two of the former and three of the latter were due to increased pressure, as they occurred about six months after the change was made. With inferior light-weight plumbing, as was originally installed in these districts, the trouble experienced was surprisingly slight.

Elmira, N. Y., advanced pressures in 1912 from about 25 pounds to 75 in the business district and similarly elsewhere. F. H. Shaw, engineer in charge of changes, reports only three cases where cast iron pipe gave way, and in all three there were indications of previous cracks. Numerous leaks or blowouts in plumbing, but no serious damage, were reported. The alterations were made during very cold weather and for two weeks many frozen services developed, some of the bursts doubtless being attributable to frozen pipes rather than to increased pressures.

In the borough of Manhattan a number of changes from low to high service have been made during the last few years in order to secure a better supply to certain districts. Notice of the proposed increase in pressure was given to house-owners, so that plumbing might be looked over and, if necessary, repaired. Very little trouble resulted. Similar changes since have been made in Brooklyn and the Bronx.

Albany, N. Y., in its business section increased pressures in 1910 from 60 to 90 pounds, with no resultant trouble; while Louisville, Ky., jumped its poundage from 40 to 70 in 1908 and reported similar freedom from difficulties.

Size and Location of Service Reservoirs

Largely upon local conditions will depend the size, the kind, and the location of service reservoirs. It may be taken as an axiom that service reservoirs are desirable under all conditions, if of such size that the contents will care for material fluctuations in demand or provide for fire-flow when other sources are out of commission. But where the action is solely that of cushioning, the value may be negative, particularly if the elevation of the flow line is such as to preclude the carrying of suitable pressures.

For the village or small town, service reservoirs, stand-pipes, or tanks may permit intermittent operation; the minimum storage under such a condition is that which will be necessary for fire demands during the time necessary to return the main source to operation. With allowance for depletion arising from domestic draft during the normal shutdown period, it is usually sufficient to provide for a one-hour fire-draft. Where, however, the storage is intended to provide part of the fire-draft, even with the main service in operation, greater quantity should be provided. The minimum desirable in any service reservoir is a capacity equal to the fire demands for a period of 10 hours in places of over 2,500 population and 5 hours for smaller places; to this should be added a quantity equal to the peak hourly demands over the normal maximum day.

With further increase in size of service reservoirs, various features of reliability of supply are at the same time cared for. Under all but the most exceptional conditions, a storage equal to 5 days' consumption, at a maximum 24-hour rate, will assure a supply —especially with proper operation to conserve it—during the time required to repair a pump or other essential piece of equipment, or to fix a main pipe line. To offset the hazard of a non-fire-proof pumping-station, however, storage should equal 10 days' maximum consumption.

Service reservoirs are an element in the economical operation of a plant, but no definite statement can be given as to the saving which may result. With elevated storage equal to the fire demand and the excess due to peak consumption, the number of wells, in a system depending upon them for a source, need only be sufficient to furnish the maximum 24-hour rate of domestic consumption and provide for a sufficient number to be out of service for cleaning. In like manner, where the supply is filtered, the capacity of the filtration plant need only be equal to that of maximum daily consumption with one unit

out of service. Equalizing storage enables the filtration plants to be operated at a uniform rate, which assures a better quality of water than when they are operated at varying rates. Where the amount of water in storage is sufficiently large, the pumps can be operated at a capacity giving their maximum economic operation.

Elevated storage becomes almost a necessity where pumping depends upon electricity for motive power. It is theoretically possible to design and install generating equipment, transmission lines, and other appurtenances to provide non-interrupted service, but records indicate that this is seldom accomplished. Where a service reservoir is not part of the system, reserve equipment, depending upon steam or internal combustion engines, must be provided.

Obviously, service reservoirs must be built substantially, and they should preferably be in two bays to permit cleaning and repairs. The location of the service reservoir is of vital importance. It may be taken as another axiom of water-supply that elevated storage shall be either in the high-value section of a city or beyond it, as viewed from the source of supply, since under these conditions fire and domestic demands at their peak will receive supply from two directions, with a minimum drop in pressure. Also, it is desirable that this storage be as close to the higher values as the topography will allow. Equally true is it, moreover, that a single place of storage, connected by large mains to the high-value district, is preferable to smaller segregated reservoirs with mains from each of sufficient size only to care for peak demands locally and a small percentage of fire demands in the high-value districts.

Many cities and towns are built on relatively flat ground, with no adjacent elevation upon which to set a service reservoir with a high-pressure gravity feed. But this need not interpose an insuperable obstacle if such a reservoir is really needed. Recent advances in the construction of steel tanks and reservoirs, particularly in the oil trade, where containers of from 1,000,000 to 5,000,000 gallons' capacity are becoming very common, makes it possible for these level cities to provide storage. With a height of 35 to 40 feet, a tank of 2,300,000 gallons' capacity which is a standard size, can be erected for approximately $40,000; and this includes a steel top, which may not be necessary for water-works use. Such a tank, erected even 100 feet above the main values of the community, will assure a degree of service well worth the expenditure.

In conclusion, let it be repeated that desirable pressures range from 60 to 75 pounds; that the raising of pressure above these figures for fires is undesirable and introduces a hazard; and that the introduction of service reservoirs adds to the adequacy and reliability of a system—although it must be remembered, the use of auxiliary reservoirs can never justify carrying on the regular water-supply a pressure lower than 40 pounds.

ACKNOWLEDGMENT.—From a paper read before the American Water Works Association, at Louisville, Ky.

The Mulholland Dam of the Los Angeles Water-Supply

Front Cover Illustration Shows Dam Giving Storage Facilities Near the City

ALMOST within a stone's throw of the busiest corner in Hollywood, Calif., rises the new Mulholland Dam, 200 feet above the boulevard. Only ten dam structures in the whole United States compare with this dam in height, and nowhere before has a city created an artificial lake holding 8,000-acre feet of water at a level 200 feet above the surrounding houses, stores, and office buildings.

One of the problems which Los Angeles has faced since building its aqueduct to bring water from the Owens Valley, 250 miles north of the city, is the storing of water at the city end of the line. This storage is necessary because the flow through the pipe must be kept as constant as possible to develop hydroelectric power. The dam, as shown on the front cover of this issue of THE AMERICAN CITY, is one of the great number dedicated to this storage. The dimensions of the dam give an idea of the importance of the undertaking. Its extreme height is 200 feet, the width across the crest 975 feet, width at the base 200 feet, thickness at the base 160 feet of solid concrete. The amount of concrete used in the construction was 175,000 cubic yards, and the cost $1,250,000. The dam is of the gravity type, arched up-stream for added safety.

Across the dam is an automobile driveway 20 feet wide and a sidewalk 4 feet wide. This drive links in with the already famous Mulholland Skyline Drive, which runs along the crest of the Santa Monica Mountains for miles and overlooks Hollywood, Beverly Hills, Los Angeles and, the fertile San Fernando Valley.

We are indebted to C. A. Dykstra, Secretary, The City Club, Los Angeles, Calif., for the photograph reproduced on the front cover of this issue of THE AMERICAN CITY.

Forward Steps in Municipal Affairs

New Municipal Building Combines City Hall, Auditorium, and Jail

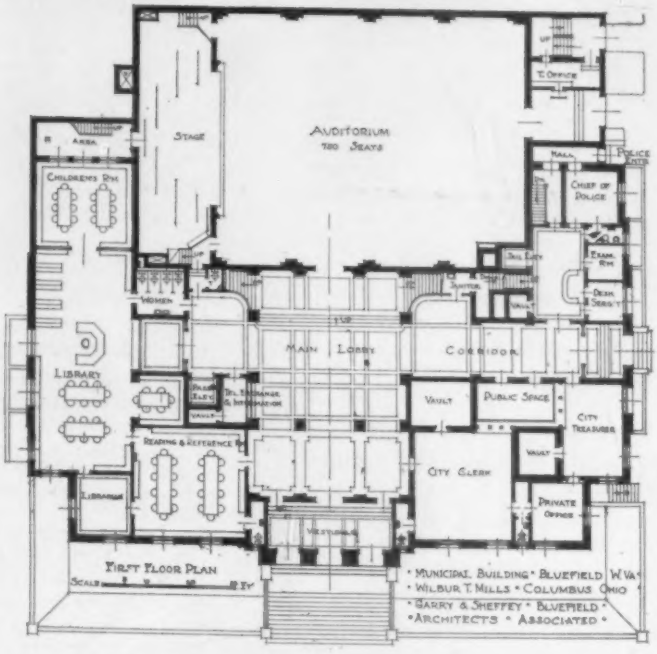
BLUEFIELD, W. VA.—This city's new municipal building is a fine example of modified classical architecture. The walls are of solid masonry construction, faced on the exterior with impervious brick of light gray color, and all ornamental work of the exterior, including the cornice, is of buff Bedford limestone. The building throughout is of fire-proof construction. All interior walls are smoothly plastered, tinted in soft, pleasing shades.

One of the striking features of the interior layout is the well-proportioned lobby extending through the three stories, surrounded on three sides by corridors on each floor. Broad stairways on each side lead to the upper floors, and all halls in the building connect directly with the lobby. An overhead lighting installation keeps this rotunda well lighted.

On the first floor, directly opposite the main entrance, is the auditorium, which has a seating capacity of 750, and a commodious stage equipped for all the forms of entertainment that are likely to be held in the hall. The auditorium is a very attractive room, with a curved and vaulted ceiling and heavy, ornamented pilasters on the side walls. At the top of these pilasters are concealed lights which afford an indirect, restful lighting effect. The balcony contains a fully equipped motion-picture booth. On the stage is a modern electrical switchboard from which all lights on the stage and in the hall are controlled. The stage lights are arranged in three circuits, of white, red and blue.

On the north side of the first floor are the offices of the city clerk, the city treasurer and the Police Department, and the city library is on the south side. The city manager, the purchasing agent, and the engineering and health departments have quarters on the second floor, where there is also a fine suite of rooms for the city directors.

The jail is located on the third floor above the auditorium, and is reached by a special private stairway and an elevator leading up from the Police Department's quarters. The police court is also on this floor, connecting directly with the jail. The remaining rooms on the third floor are for the present unfurnished, this additional space be-



FIRST FLOOR PLAN AND EXTERIOR VIEW OF BLUEFIELD'S NEW MUNICIPAL BUILDING

INTERIOR VIEWS OF BLUEFIELD'S MUNICIPAL BUILDING
1—Rotunda 2—Auditorium
3—Health Laboratory 4—Part of Public Library

ing left available for any needs that may arise with the future growth of the city.

CLARENCE E. RIDLEY,
City Manager.

Flashing Beacons at Trolley Safety Isles

BALTIMORE, MD.—The Police Department of this city feels assured that the public safety is being much more effectively guarded by the present type of safety zones at trolley stops. For about ten months the Department has been using intermittent beacons, made by the American Gas Accumulator Company, to mark the ends of concrete trolley loading platforms, or of safety zones indicated by painted lines on the pavement. The "blinkers" are of the same type that is used at dangerous street intersections. This has done away with the standards and chains formerly used to mark safety zones, and the new arrangement has proved very beneficial.

The concrete loading platform with the blinker lights is the more satisfactory of the two types of safety isles. The sectional construction of the platforms is interesting. The concrete slabs are about 8 feet long and 4 feet wide, and are hollow on the under side. They are made in the yard of the United Railways and Electric Company, and are easily carried on flat cars to any point on the line. The platforms are readily installed, and may be lengthened or shortened by the addition or elimination of sections.

There are now thirty-four of these beacon-equipped zones in the city.

CHARLES D. GAITHER,
Police Commissioner.

Reconstruction of Nashville's Parthenon

NASHVILLE, TENN.—The Parthenon in Centennial Park, Nashville, which has been recently reconstructed in permanent form, is indeed a beautiful and imposing structure. This building was first erected in 1897 to be used during the six months' Tennessee Centennial Exposition held in that year, but the columns and the figures in the pediments and frieze were then made only of plaster, and as the years have gone by the work has gradually fallen apart.

The restoration has been made in an aggregate of cement, sand, and Potomac River crushed gravel. The color is old ivory. We sent to England for casts of the Elgin marbles of the original Parthenon of Athens, and from these casts the figures for our building were modeled. All of the work has been executed with the utmost accuracy of detail, and the finest artisans and sculptors

SAFETY ISLES AND FLASHING BEACONS ON NORTH AVENUE AT CORNER OF ST. CHARLES STREET, BALTIMORE

THE RESTORED PARTHENON, NASHVILLE

available were employed. The reconstruction has now been going on for four years. The exterior is finished, but there is some work yet to be done on the interior.

JOHN S. LEWIS,
Secretary, Board of Park Commissioners.

Budget Procedure for Utah Municipalities

SALT LAKE CITY, UTAH.—Chapter 15 of the laws of Utah, Session 1925, relates to budget system for cities of first and second classes, and Chapter 30, of the same laws, to budget system for cities of the third class. These new laws provide, in effect, that on or before October 1 in first and second class cities, and November 1 in third class cities, the proper officers shall file a detailed statement of the revenues and of all the necessary expenditures of the city departments, setting forth among other things the number of persons to be regularly employed, the kinds of service to be performed and salaries to be paid. In cities of the first and second class the City Auditor, and in cities of the third class the City Recorder, shall file a tentative budget setting forth, in detail, the revenues and expenditures of the preceding calendar year, the estimated revenues and expenditures for the current calendar year, the departmental requests for the expenditures for the next succeeding year and his estimate of the revenue for the next succeeding calendar year based upon the lowest rate of tax levy which, in his opinion, will raise the required amount of revenue. The tentative budget is to be accompanied by detailed estimates furnished by the different departments, a statement showing financial condition of the city by funds as of September 30 of the current year, and an estimate of financial condition by the close of the current year. The budget is to be immediately available for public inspection after presentation by the Auditor or Recorder.

On or before December 31, the City Commissioners or City Council shall adopt a budget for the next calendar year and pass an appropriation ordinance to govern expenditures. A notice of the meeting for the adoption of this budget must be published at least one week in advance of the holding of the meeting and a public hearing shall be held before the budget is allowed. Appropriations in excess of the estimated revenue are unlawful. All unexpended balances of appropriations appearing at the end of the year shall revert to the funds from which they were appropriated. A reduction in appropriation may be made provided that all Commissioners and Councilmen are given a week's advance notice. No increase may be made in any budget appropriation except by a written request of one of the Commissioners, which shall be made available for public inspection, and the request will not be allowed unless notice of consideration of the request has been published in the newspaper for one week.

ROBERT N. YOUNG,
City Treasurer, Salt Lake City.

Costs of Garbage Collection in Columbus, Ga.

THE cost of garbage collection in Columbus, Ga., during the fiscal year 1924-25, according to the *City Manager Magazine*, is less that that for the previous year because of the increased efficiency of tank trucks over horse-drawn wagons. The net cost of collection per ton for 1924-25 was $3.88, while for the previous year it was $4.33. The per capita cost of collection was 0.432 cents for 1924-25, as against 0.489 cents for the previous year. There were also fewer complaints, the number for 1924-25 being 2,923, against 3,753 for the previous year.

Experiences with Portable Water-Waste Detectors

Interesting Collection of Reports from Widely Scattered Cities

WATER waste, leakage, or whatever other name is given to it, is a drain on the finances of any water department. It is an expensive proposition even to pipe water from an excellent spring into the city and distribute it. In other cities where there is the need of constructing huge impounding reservoirs or great pumping-stations and filtration plants to gather the water, purify it, and send it into the distribution system, the cost is far greater.

In recent years small portable devices have been developed which have been of great value to water departments in locating leaks in mains and at service connections. In some cities these devices have been so effective that 80 per cent of the water which was formerly wasted has been saved through accurate location of the leaks, and minimum time lost in excavating and making the necessary repairs.

Through correspondence with a large number of cities, we have secured some interesting reports, some of the best of which we are abstracting for the information of our readers:

KNOXVILLE, TENN.

Stuart Fonde, Assistant Engineer, Water Dept.

Fourteen months ago the Water Department of Knoxville, Tenn., had none of the instruments used in the operation of an up-to-date water department. The records and maps were unreliable and consequently seldom referred to. Many services were installed without a single sketch or plan for the foreman. The foreman was the engineer, foreman, timekeeper, and inspector. When the job was finished, he was the record book also. Much dependence had to be put upon the employee's knowledge of installations, and many times it was found that his memory was woefully distorted. The Department has come to grief many times because of this unreliable practice.

One of the first incidents which the writer met after becoming associated with the Water Department was three leaks caused by electrolysis. These leaks had been going on for months and were growing larger each day. They discharged through a sewer drain and flowed about 1,000 feet down a curb line where any one could see the water. Several of the employees stated that the discharge came from a spring some 1,000 feet from where the water could first be seen. An investigation revealed the service leaks, and a crew repaired two of them immediately with little difficulty. The custom had always been to dig over the main opposite the meter and either pull and replace or repair the service line. The first two leaks repaired were located in this manner, but in the third case the service line did not connect to the main opposite the meter. The hole cut for this leak was enlarged and still the connection between the main and service could not be located. The workmen tunneled along the main as far as they could reach either way, but still found no connection.

The Water Department had just bought a wireless pipe finder, but none of the subordinate personnel knew how to use it. Colonel F. W. Albert, the engineer who had been placed in charge of the Water Department, asked the writer to locate the connection between the service and the main with the pipe finder. After reading the instructions, I found the operation very simple and successful. The workmen's tunneling bar lacked about one inch in going to the right spot. The leak was cut off in two hours and the repairs promptly made.

Several months went by, with the pipe finder and an Aquaphone as our main standbys. It was impossible to find the exact location of the leak, but we could locate the service by means of the Aquaphone and trace it out by the use of the pipe finder. This was a considerable improvement over the old method of cutting until the leak was found. Every waterworks engineer realizes the expense of repairing a cut in a paved street.

None of the subordinate personnel of the Water Department seemed to know much about Geophones or to have had experience with them. If there were any instruments that could help us to reduce the number of street cuts, we were willing to be convinced that they were worth a trial at least. A Geophone was borrowed from a near-by town and used with little success. I was not convinced that the instrument had had a fair trial, so I was willing to contract for one on a 30-day trial. The instrument was received, but it was diffi-

cult to get anyone to use it. The writer found it necessary to go out on several inspection trips and talk of the merits of the instrument and actually put it to use before enough interest and confidence were developed to induce the inspector and leak man to use it of their own accord. They finally became accustomed to it and were enthusiastic over the results they were getting. Before the 30 days were up, they had as much confidence in the practicability and value of the instrument as they had displayed skepticism toward it before seeing it used. In 60 days it paid for itself in street cuts alone. It has detected with accuracy the location of several very bad leaks and is now considered an important instrument in all our investigations.

The only objection that has been found to the instrument is that it amplifies all of the sounds of traffic, wind, and distant noises, and can be used on deep and small leaks only in the quiet of night. One has to train his ear to detect the characteristic sounds of the leak, but after some practice he can use the instrument very successfully where an excess of outside noises is not prevalent.

The most interesting leak on which the Geophone showed itself valuable was on a broken 4-inch lead pipe directly under a car track. The leak was reported by a gas company employee who was unable to work in the hole he had dug because of the water rising in the hole. The leak foreman was placed on the job and immediately repaired three small service leaks. He felt sure his job was complete, but water still flowed into the hole cut by the gas company employee. A night was set aside for an investigation with the Geophone. A leak was found by putting the instrument on fire-hydrants until the fire-hydrant on which the loudest noise occurred was found. We then decided to listen on gate-valves by placing a key on them and listening on the key. The first valve struck gave a very distinct and loud roar. We then placed the instrument around on the street and located the leak directly under the car track. A 4-inch lead pipe was broken into and many thousands of gallons of water per day were going through the leak and escaping through the drains underneath the car tracks. The waste was stopped immediately by repairs to the pipe line. This leak was spotted several days after the purchase of the Geophone and dismissed all doubt as to the practicability of the instrument.

TACOMA, WASH.

W. A. Kunigk, Superintendent of Water-Works

We are using in our Water Department a Darley Sonoscope or water-phone almost exclusively. We use this instrument in conjunction with a sounding rod or portable key attached to a gate, or by listening in on hydrants where they are spaced close enough We prefer this instrument to some of the more elaborate microphones which we have tested out, and find that we can get just as good results from the instrument that we are using.

SCARSDALE, N. Y.

Franklin Henshaw, Supt., Water Department

Our problem has been a pretty serious one. Soon after the village took over the existing water-supply, it was found that 65 per cent of the water pumped was not recorded on consumers' meters—and we are 100 per cent metered. Unlike most water departments, we buy the water we pump at the rate of $133 per million gallons. This makes a leak situation extremely serious.

In the location of leaks we have used with a great deal of success a Darley wireless leak locator, the Geophone, Aquaphone, and several similar instruments. The Geophone would probably have been used a great deal more than it has been if it could have been used with more comfort. The tubes connecting the phone with the ear pieces on the instrument we have are so short that the operator has to assume a most uncomfortable position, and when spending the night combing the system for leaks the operator soon becomes tired out.

The Darley wireless locator is very easy to use and after a very slight experience gives very good results. With this instrument we went over our 27 miles of pipe, listening approximately every 20 feet, and succeeded in bringing the unaccounted-for water down from 65 per cent to 12 per cent. When you consider that water used for fire purposes, flushing sewers, and other municipal uses is included in the unaccounted-for water, the 12 per cent referred to is a fairly good result. Our leakage has varied from 12 to 18 per cent since the foregoing results were achieved. We found it advisable when hunting for leaks under concrete roads to do the work at night, and, in fact, all of it can be done very much better at that time because of the delicacy of the instrument in transmitting traffic noises which drown the noise of the leak. Cutting through concrete pavements is expensive work, and even if a leak should show on the surface, it is by no means certain that it is located exactly under the place where it appears on the surface. It is important, therefore, to reduce the excavating work to a minimum with the use of a leak locator, and

our success in this way has paid for the instrument over and over.

DAVENPORT, IOWA

F. B. White, Jr., Davenport Water Company

During 1924 all the services in the city of Davenport were inspected. Men from the meter department were sent out with Sonoscopes that amplified the sound of the service leaks. These leaks were reported to the Superintendent, who afterwards made a more thorough and final inspection.

The stop-boxes were opened and a street key was set on a rod, upon which the Sonoscope was placed. The water was shut off at the meter shut-off. Then, to determine on which side of the stop-box the leak was located, a test was made. For example, if the shut-off was closed at the stop-box and the sound could be heard, the indications were that the leak was between the main and the stop-box. On the other hand, if the sound stopped, the indications were that it was between the meter shut-off and the stop-box. By this method, 56 out of 11,878 active services were found leaking. Our meter readers carry Sonoscopes with them and are continually on the watch for any wasting of water.

MILTON, MASS.

D. A. Heffernan, Superintendent, Water Dept.

Up to six or seven years ago the instruments we used for detecting water waste were simple Aquaphones. At that time we purchased a Darley leak locator on trial and sent our check after having located a leak exactly on a 1-inch galvanized pipe about 400 feet long. Since that first time, however, we have been rather unsuccessful in using it.

Last December the Venturi meter measuring the supply to our low-pressure service indicated an increase of about 150,000 gallons per day, with no apparent reason except a possible leak which did not show on the surface. We divided the town into ten sections and tested each section by means of test pits and a 2-inch meter. The testing was done between one and four in the morning. The third morning we located the leak in the last section. It was then a simple matter to confine it to a smaller area, and after marking out our pipe lines on the street surface, we went over the pipe with a Geophone which we had purchased especially for this leak. We determined the point at which we thought the leak was located and then found, the following day, we were not two inches out of the way. The really remarkable point in this work is the fact that we never had used the instrument before and were unfamiliar with the sounds it would produce.

MALDEN, MASS.

John A. Carter, Superintendent, Water Division

We have used the Darley electric leak locator and the Geophone with very good success at time. The most successful method we use is to take a thorough test of the system. First, a certain section is shut off and fed through a 2-inch meter with a fire-hose from a hydrant. If a leak is found in the section, the section is shut off and then the various streets in the section gated off one at a time until the leak is located. This testing is usually done at night when there is not much draft and when there is more likelihood of the leak's showing up.

STAFFORD SPRINGS, CONN.

Walter P. Schwabe, General Manager

We have had only one experience with portable waste detectors. A few years ago we had an unusually large draw on our water-supply which we finally decided was due to a leak, but we were unable to locate it. We called in the Pitometer Company and by inserting a portable pitometer into the supply main and shutting off a number of valves throughout the town, we located the branch on which the leak was occurring in about two hours' time. It was then discovered that there was a bad leak in the main and the water from the leak was flowing underground to a near-by pond.

OKLAHOMA CITY, OKLA.

C. E. Bretz, Superintendent, Water Department

I have spent two years making water-waste surveys. The instrument used in the surveys was a pitometer rod with a recording instrument. When it comes to real waste detection, I believe the pitometer rod combined with a recording device is the only real way to be certain of finding all waste water. The trouble with this instrument is that it practically takes an expert to operate it. From the water-works superintendent's standpoint, I consider the use of the Aquaphone the most valuable waste detector. We have about 20 of them in use in our department. All inspectors and repair men carry them, and, with a little practice, it is surprising how accurately leaks can be located. We use Aquaphones constantly, and daily they disclose leaks.

In Oklahoma City we sold for the last fiscal year 77 per cent of the total amount of water

pumped. Free water is allowed to all municipal buildings, and for street sprinkling, sewer flushing, fire fighting, and watering parks. Taking this into consideration, we feel that our leakage and water waste is small.

GENESEO, N. Y.
George R. Meeker, Supt. of Water-Works

My experience with portable waste detectors has been rather limited, but satisfactory in all respects.

Efficiency in Rubbish Disposal

Method of Handling Junk and Tin Cans in Highland Park, Mich.

HOW to take care of alley and street rubbish efficiently and economically is in many cities a real problem, particularly in the built-up cities with limited or distant dumping grounds. The method used by the Public Service Department of the city of Highland Park, Mich., under the direction of Martin H. Zink, Superintendent, is worthy of consideration and could be readily applied to other cities in whole or in part.

There are two disposal grounds for Highland Park, the large one, or dump, being about 5½ miles from the city, and the smaller one, the Yard, about a mile from the city. Tin cans and small sheet metals are taken to the Yard, where they are pressed into blocks weighing about 35 pounds each. This is done by a small, electric-driven block press operated by two men, who make approximately 270 blocks per day, along with their other duties. The blocks of metal are sold for $4.75 per ton. The miscellaneous metals, consisting of bed and couch frames and springs, auto frames, auto fenders, etc., are taken to the Yard, where they are cut up into small lengths by one man, using small motor-driven alligator shears, and they are then sold for $8.25 per ton. Hot-water tanks are sold for $5 per ton, heavy steel for $10.50 per ton, and cast iron for $12 per ton. These prices are made to cover a certain period of three to six months and are all f. o. b. the Yard. The return from scrap alone was $4,500 last year.

Broken concrete is also taken to the Yard, where it is crushed into useful sizes and used for alley and other like construction, making a valuable saving of material, as the city does considerable of its own concrete work. Paper,

SCENES IN THE HIGHLAND PARK, MICH., JUNK YARD, SHOWING THE BREAKER, BALER, CUTTING MACHINE, AND INCINERATOR

dead leaves, old mattresses and similar combustible rubbish is also taken to the Yard, where it is burned in a large brick furnace which has been built between the incinerator plant and its large smoke-stack. The incinerator plant is not being used now, as the garbage is being sent to the city pig farm. The pig farm is also run at a profit.

The large dump is used for street sweepings and riffraff material not taken care of at the Yard. When you add to the $4,500 from the sale of scrap the tremendous saving in time and hauling cost between the dump and the Yard, a saving of 9 miles per trip, the economy of the arrangement is apparent.

The Yard does not have the appearance of a junk yard or dump, as everything is organized in a business-like manner, with no large accumulations of materials. This method does not interfere with the collecting of rubbish or with the Street and Alley Cleaning Department, but helps it tremendously, as everything now has a definite place to which it can be taken quickly, and where it can be efficiently and properly disposed of.

The city of Highland Park is a well-built-up city of approximately 67,000 inhabitants, adjoining Detroit. Its Service Department last year took care of 6,942 tons of garbage, 8,485 loads of alley rubbish, and 3,120 cubic yards of street cleanings.

CITY OF HIGHLAND PARK, MICH., GARBAGE DISPOSAL

Ten Months to May 1, 1925

Population served, 67,000 estimated
Miles of alleys, 38 2/9, of which 28.87 miles paved
Length of haul to pig farm, approximately 8½-mile road trip
Number of employees, 10 (4 drivers and 6 loaders)
Number of trucks, 6 months, 4; 6 months, 3
Tons of garbage, 10 months, 5,635 tons
Maximum, July, 740; minimum, January, 418; average, 563
Collections—residences, 2 weekly; business district, daily

Cost Ten Months	
Salary, superintendent ½-time	$ 1,041.60
Pay-roll—labor	16,430.29
Contract pig farm—$1 ton	5,635.00
Disposing dead dogs	267.00
Miscellaneous supplies	1,059.46
Gasoline and oil	1,650.00
Truck maintenance	2,692.62
Total cost ten months	$28,775.97
Cost per month	$2,877.60
Cost per ton	5.02

To the above should be added the depreciation of the equipment

This system and method of disposing of rubbish could be applied to other cities without question of satisfactory results, and any municipality would be the better for such a system. Some cities that have already noticed the work that is being carried on in Highland Park have already started along these lines with very satisfactory results.

Some Sewage Disposal Problems Discussed

By Earnest Boyce

Chief Engineer, Division of Water and Sewage, Kansas State Board of Health, Lawrence, Kans.

SEWAGE disposal has for its purpose the realization of one of two objectives—either such treatment of the sewage that a local nuisance will not exist, or such treatment that water purification plants taking their supply from the receiving stream will not be compelled to remove an excessive amount of pollution. On a small stream, of course, both of these objectives must receive consideration. Where dilution can be used without local nuisance or detriment to other users of the stream below, it is considered to be a proper method of sewage disposal. Some streams have high seasonal variations of flow, which are greatly increased by the diversion of water from the stream for irrigation purposes. Because of this, rather complete sewage treatment is needed in certain seasons of the year in order to prevent the creation of a local nuisance.

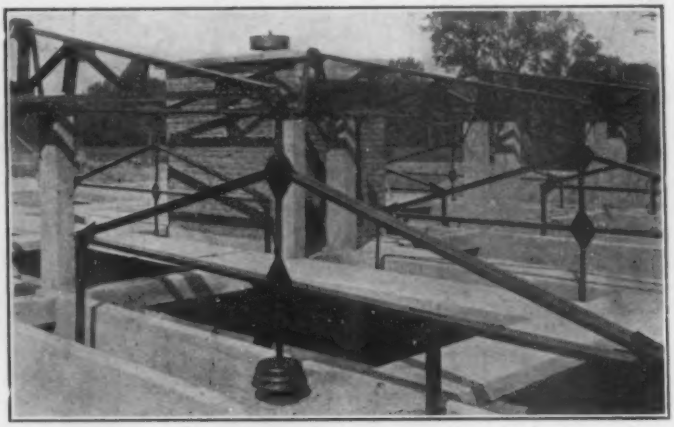
What Constitutes a Nuisance?

It is sometimes a bit hard to decide just when a nuisance exists. The Kansas State Board of Health considers that a nuisance exists when sewage is discharged in such manner that the dissolved oxygen of the receiving stream is exhausted and the odors of putrefaction become offensive; also when, because of the location of the stream as regards residences, public roads, etc., there is objection to the physical appearance of the sewage-laden stream.

One popular belief that has to be combated continually is the erroneous one that the effluent from a septic tank will not produce a

nuisance when discharged without dilution or secondary treatment of some sort. There are a great many plain septic tanks in operation to-day. Sometimes they are so located that the odor of the putrescible effluent does not cause complaint and the remoteness precludes danger from flies, etc. In such cases there is, perhaps, a minimum need for secondary or oxidizing treatment. The city or town maintaining the plant, however, is always subject to complaints on the matter. When they arise, the burden of proof rests with the city to show why the thing complained of should not be abated. As we see it, the discharge of putrescible sewage does not in itself constitute a nuisance, but it may easily become a nuisance when it interferes in any way with the public or individual health or comfort.

It is not impossible for a trickling filter in normal operation to cause just as much complaint of odors in its vicinity as might be occasioned by septic tank treatment alone. It may become in reality the occasion of a nuisance—and yet its effluent may be very well oxidized. One is reminded of the story of the tree falling in the forest without producing sound because no ear heard it. A nuisance in order to be a nuisance must be the cause of a just complaint on the part of some one, and if no one is injured or complains and there is no potential danger of injury, then it perhaps would be difficult to show the existence of a nuisance.



MOTOR-DRIVEN WALKING-BEAMS WHICH ACTUATE SCUM AGITATORS IN THE GAS VENT OF THE SEWAGE TREATMENT PLANT AT PITTSBURG, KANSAS

Protection of Fish Life

The question of protecting the fish life in a stream, during low-water stages, from the exhaustion of dissolved oxygen caused by the sewage present in the stream, introduces a factor that does not come under public health measures nor does it appear to constitute a nuisance from the health standpoint. There are, however, those who have a right to expect that the normal fish life of a stream will not be destroyed and their riparian rights should be respected by the city discharging sewage into the stream. With our growing use of streams and rivers to carry away human wastes in large amounts as well as industrial wastes of many kinds, this problem will be of increasing interest and importance.

Protection of Public Water-Supplies

When we take up the problem of treating sewage waste in order that the water-supplies may be protected, we are working toward a

INTERESTING LAYOUT OF SEWAGE TREATMENT PLANT AT HOXIE, KANSAS

more definite objective. We must treat the sewage, not to prevent local complaint, but rather to hasten the mineralization of the organic matter contained in the sewage. Incidentally, we destroy the food materials in the stream upon which certain objectionable bacteria might feed. For a similar reason, we reduce the probable quantity of algæ growing on the stream. By doing these things we make it possible for properly designed water filtration plants to complete the purification process without a bacterial overload.

When sewage is treated to eliminate a nuisance, the treatment is satisfactorily completed when the nuisance is eliminated. When we are concerned with the bacterial and organic content of receiving streams, in the interests of water users below the sewage outlet, the degree of sewage purification has no limit other than that imposed in the interests of economy. One might consider the quality of the water in the receiving stream above the sewer outlet as representing the practical limit to which the purification of the sewage might ultimately be carried. Such a result, however, is not probable unless chemical disinfection is employed.

Operating Reports

In order that information may be available at all times as to the amount and character of the pollution entering the waters of Kansas, it is provided that each municipality, corporation, or person contributing sewage pollution shall furnish the Kansas State Board of Health with this information. This is done by means of monthly operating reports made on blanks furnished by the State Board of Health. The reports state the quantity of sewage discharged, with an indication of its degree of purification. They also give information as to the operating condition of the plant and thus furnish to the city a record that is of value. The tests required are simple. The settling solids are determined by the Imhoff-cone measurement, and the relative-stability by the methylene-blue test, but they serve to indicate the character of the treated sewage. In case no secondary treatment is required, the stability test, is, of course, omitted, unless samples are required from the receiving stream in order to give an indication of the oxygen content—or rather of its possible absence during periods of low flow.

Principles of Sewage Treatment

The methods most commonly used to break down the highly complex and unstable organic nature of sewage and change it into inert earthy matter, the end of organic decomposition, are those which make use of the natural bacterial action of decay. The best-designed disposal works are those that furnish, as it were, the best workshops for this bacterial action. Because of the small amount of organic matter present in sewage when compared with the volume of water to be handled, and because of some of the charcteristics of the bacteria themselves, the design of an ideal working place for them presents some interesting problems.

The activated sludge method of sewage treatment is designed to oxidize the organic matter appearing in suspended form, in liquid, and in semi-liquid or colloidal form. This is done by bringing together under the most favorable conditions possible the flocculent masses of oxidizing ærobic bacteria, the air necessary for their life, and the organic matter to be treated.

The great majority of disposal works, however, can have these major processes divided into two steps: primary treatment, meaning those processes whereby suspended solids are removed from the sewage, and secondary treatment, referring to that portion of the bacterial workshop where the organic matter which appears in the sewage in liquid form is mineralized by oxidation. Ideal results are obtained from a septic, Imhoff, or sedimentation tank where there is complete separation of suspended matter from the sewage passing through, with little change in the liquid portion. With a clear conception of the purpose of these tanks and a realization that organic matter in liquid form is little changed by the tank treatment, we are able to judge better when tanks can be used. Otherwise, we need to provide a workshop where the oxidizing of the organic matter contained in the sewage liquids can take place.

It is not within the scope of this discussion to consider the various types of sand filters, contact beds, trickling filters, etc., that are used for this purpose. The problem in the past has been very largely one of suitable design—it is now rapidly becoming one of suitable operation. Suitable operation cannot be had unless sewage treatment plant operators have a clear conception of the biological principles involved. Most of the disposal plants which are not operating properly are failing because they are operated in such a manner as to interfere with the normal life-cycle of the

KANSAS STATE BOARD OF HEALTH,
DIVISION OF WATER AND SEWAGE,
LAWRENCE, KANSAS

MONTHLY OPERATION REPORT OF SEWAGE DISPOSAL PLANT

_____ Kansas,
_____ 192__

Gentlemen: In compliance with the requirements of section 4, chapter 282, Laws of 1907, as amended by chapter 238, Laws of 1909, we hand you herewith the following report of operation of the _____ Sewage Disposal Plant for the month of _____, 192__.

PLANT DATA					IMHOFF TANKS								SEPTIC TANKS						CONTACT BEDS—SPRINKLING FILTERS						FILTERS					
Serial No.	Purpose of Test	Temp. Air	Temp. Sewage	No. of Hours Run	Capacities of Chambers	Average Depth of Scum: Gas Vent	Average Depth of Scum: Sed. Chmbr.	Average Depth of Sludge	Settling Solids: Inlet 1 hour	Settling Solids: Inlet 2 hours	Settling Solids: Outlet 1 hour	Settling Solids: Outlet 2 hours	Capacities of Chambers	Average Depth of: Scum	Average Depth of: Sludge	Settling Solids: Inlet 1 hour	Settling Solids: Inlet 2 hours	Settling Solids: Outlet 1 hour	Settling Solids: Outlet 2 hours	Material of: Contact Bed	Material of: Sprinkling Filter	Settling Solids Taken: 1 hour	Settling Solids Taken: 2 hours	Sterilizer: Dilution	Sterilizer: Figure	Treated (or, if Combined, Cleaned) Filter No.: 1	Treated (or, if Combined, Cleaned) Filter No.: 2	Treated (or, if Combined, Cleaned) Filter No.: 3	Treated (or, if Combined, Cleaned) Filter No.: 4	Quality: Dilution	Quality: Figure
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

a. Date of last sewage treatment _____ What was done? _____
b. Date of last removal of the sludge from tank. _____
c. Depth of wet sludge on sludge bed. _____
d. Depth of the same sludge when dry. _____
e. Date of last removal of dry sludge from bed. _____
General remarks: _____

SEE OTHER SIDE FOR DIRECTIONS FOR MAKING TESTS AND FILLING OUT REPORT.

Respectfully submitted,
_____
(Name of municipality or company)
By _____
(Name of officer)
State of Kansas, County of _____, ss.
Subscribed and sworn to before me, a notary public in and for said county and state, this _____ day of _____, 192__.
_____
Notary Public.
My commission expires _____.

INSTRUCTIONS ON REVERSE OF REPORT BLANK REPRODUCED ABOVE

Tests.

Samples of raw sewage and of the effluents of the various tanks, beds, etc., should be taken at least twice weekly, and tests for relative stability and settling solids run on these

RELATIVE STABILITY.

Fill a 4-oz. bottle to overflowing, add 1 c.c. Methylene blue solution. Insert Stopper and let stand at room temperature till the blue has faded out. Note the number of days to change the color, and record the stability figure.

A sewage may be called stable when the contained organic matter has taken such a form that it is not capable of undergoing offensive putrefaction.

Relative stability is the ratio of the available oxygen in the sample to the amount required to render it stable.

A stability figure of 75 means that the sample contains 75% of the oxygen necessary for stability.

The accompanying table gives the stability figures for different periods.

For effluents of extremely low stability dilutions should be made in aerated water and the relative stability of the mixture noted. A few trials will be necessary before the proper dilution may be determined.

Time Required to Decolorize Methylene Blue at Room Temperature. Days	Stability Figure
0.5	11
1.0	21
1.5	30
2.0	37
2.5	44
3.0	50
4.0	60
5.0	68
6.0	75
7.0	80
8.0	84
9.0	87
10.0	90
11.0	92
12.0	94
13.0	96
14.0	96
16.0	97
18.0	98
20.0	99

Settling solids. Place 1000 c.c. of sample in settling glass and allow it to remain quiet. Record c.c. of sediment in bottom of glass at the end of 1 hour, 2 hours, from time of filling the glass.

This test approximates the action in a settling tank, and a comparison of the effluent of a tank with a sample that has had a settling period in a glass of equal length to the detention period in the tank gives a good check on the operation of the tank.

WHAT TO RECORD

Column No.

1. Whether the stream is "flood," "low," "frozen," etc.
2. If sewage is pumped a record should be kept of the time pumps are in operation. If the sewage flows by gravity it may be possible to install a V notch weir and readings taken of the head on this weir. If there is a dosing tank for contact bed an automatic counter can be installed. The Division of Water and Sewage, Board of Health, will gladly furnish assistance in installing one of these devices and make the necessary computations so that the work for the operator will be minimized.
3. Temperature of the air at the plant.
4. Temperature of the sewage at the plant.
5. If the plant consists of more than one Imhoff or Septic tank give the number that are in use.
6 and 14. Whether it is "foaming," "no action," "considerable action," etc.
7. Measure the depth of scum at different points in the gas vents and record the average of these figures.
8 and 15. Measure the depth of scum at different points in the sedimentation chamber and record the average figure.
9 and 16. Take samples at different depths by means of the "sludge sampler" and record the average depth of the sludge.
10, 11, 12, 13, 17, 18, 19, 20. Take a sample of sewage entering the tank and another sample after the sewage has passed through the tank and make the test for settling solids as described above.
21. A period of contact for a contact bed is the time after the filling of the bed is completed until the bed starts to discharge. The period of contact for a sprinkling filter is the time of spraying. In some plants this is continuous and in others intermittent.
22. Period of rest for a contact bed or sprinkling filter is the time between doses of sewage when the bed is standing idle.
23 and 24. Samples of sewage after passing through the contact bed or sprinkling filter should be taken and tested as directed above for settling solids.
25 and 26. Take another sample from the same place as for 23 and 24 and test as directed above for stability.
27, 28, 29, 30. Whenever a filter is turned off, on, cultivated, scraped or cleaned, it should be recorded in the proper place. Your filters should be numbered and these numbers used whenever referring to that particular filter.
31 and 32. Samples of the sewage should be collected after it passes through the filter and tested for stability as directed above.

microscopic life upon which their success depends.

Disposal of Industrial Wastes

We not infrequently find trade wastes which do not lend themselves to the mode of treatment that has proved satisfactory for domestic sewage. Many of these present new and sometimes complex problems. Perhaps one of the most troublesome trade wastes to be found in the average Mid-West town is sewage that carries milk waste from a creamery or other milk-handling station. There have been a number of municipal disposal plants that have been rendered useless, in so far as effective action is concerned, by creamery wastes. It is found that this and certain other trade wastes cannot be discharged into a system designed for domestic sewage without producing a condition in the disposal plant that not only inhibits the mineralization of the organic matter carried by these wastes, but also prevents the proper breaking-down of the organic matter in the domestic sewage. We believe that the solution of the problem lies in the installation at the source of these industrial wastes of such treatment devices as may be necessary to change the characteristics of the particular waste so that it may enter ordinary sewage without causing difficulty in its treatment.

The handling of certain refinery wastes which are particularly objectionable because of their odors and tastes, is a real problem and one that does not as yet have a general solution. In some instances, large impounding reservoirs hold the refinery wastes for months and are emptied into the receiving streams at times of high water. The salt-water pollution of oil fields has also caused considerable trouble. This salt water is with the oil, and its disposal in the quantities produced has been difficult.

These wastes have great public health significance, not because of danger in themselves, but because their presence in a city water-supply will encourage the use of private wells that may be dangerously polluted.

Protection of Plants Against Storm-Water

Another frequent source of trouble in operation is the failure to protect the disposal plant properly from sudden disturbances due to storm-water. Roof drains, perforated manhole covers, and poorly constructed manholes will never be entirely eliminated, and until they are reduced to a minimum there is need of a by-pass weir at the entrance to a disposal plant. This practice is based on the theory that it is better for a little sewage to go without treatment during a storm period when there is the least danger from it than for the good operation of the plant to be prevented for a considerable period following the storm because of the disturbance caused by passing an excessive volume of water through it.

Better Operation Needed

The choice of men to have charge of disposal plants is an all-important matter. Too frequently they have little to qualify them for the work, and they frequently lack interest in it. Often they are already employed by the city, this work having been added to their work to receive their attention in spare moments. No man can be expected to do creditable work unless he is interested in what he is doing, and he can hardly be expected to be interested unless he understands the work he is doing. Groups such as sewage treatment conferences fostered by state educational institutions add much to the general fund of information and revive individual interest in the work.

ACKNOWLEDGMENT.—Prepared from a paper presented at the Sixth Conference on Sewage Treatment, at Ames, Iowa.

Campaign Material for Fire Prevention Week

A number of items of fire prevention literature, posters, etc., especially prepared for use in connection with the 1925 Fire Prevention Week campaign, October 4 to 10, have been issued by the National Fire Protection Association. This material is intended for quantity distribution and will be supplied to all those interested in campaigns to reduce fire losses, as nominal charges which are made to help cover the printing costs. The material available includes: *The Story of Fire Prevention Week*, a four-page leaflet telling the story of the reasons underlying the observance of Fire Prevention Week; *Fire Prevention Week Handbook*, a fifty-page illustrated handbook intended primarily for the guidance of committees and others planning campaigns; *Facts, Texts and Slogans*, containing material especially valuable for speakers, newspaper publicity, school exercises, etc.; *Fire Prevention Week Speech Texts*, a pamphlet giving suggested texts for use by those giving radio broadcasts, speaking before luncheon meetings, etc. Stickers suitable for use on correspondence, parcels, etc., in connection with Fire Prevention Week campaigns have also been issued.

Price lists of the above material, as well as general information on fire prevention, may be obtained upon application to the Association, 40 Central Street, Boston, Mass. All those desiring to secure supplies of literature are urged to order them promptly in order that there may be no delays in shipment.

Electric Lighting Rates, New York State

THROUGH the courtesy of the Public Service Commission of the state of New York, with headquarters at Albany, THE AMERICAN CITY is enabled to publish the following statements showing for each city and incorporated village in the state the maximum gross rates for residential lighting by electricity contained in schedules in effect July 1, 1925.

In most instances these rates apply for a specified quantity consumed per month with lower rates for quantities used in excess thereof. In some instances corporations have other rates in effect under which a lower rate per kilowatt-hour may be obtained by those able to comply with the requirements for service, or who voluntarily elect to take service thereunder. Discounts for prompt payment and penalties for delayed payment are disregarded.

Maximum Gross Rates for Residential Lighting by Electricity per Kilowatt-Hour

Adams	$ .17
Addison	.10
Afton	.15
†Akron	.10
Albany	.08
Albion	.10
Alden	.09
Alexander	.12
Alexandria Bay	.12
Allegany	.08
Altamont	.08
Altmar	.08
Amityville	.10
Amsterdam	.10
Andes	.30s
†Andover	.10
†Angelica	Note 3
Angola	.08
Antwerp	.10
†Arcade	.11
Ardsley	.12
Arkport	.12
Athens	.15
Attica	.12
Auburn	.11
Aurora	.15*
Aurora	.12s
Avoca	.14
Avon	.10
Babylon	.10
Bainbridge	.16
Baldwinsville	.08
Ballston Spa	.10
Barker	.10
Batavia	.09
†Bath	.12
Bayville	.10
Beacon	.15
Belleville	.15
Bellport	.13
Belmont	.11
†Bergen	.10
Binghamton	.15
Black River	.09
Blasdell	.06
Bloomingburg	.11
Bloomingdale	.12½
Bolivar	.09s*
†Boonville	.07
Brewster	.11
Briarcliff Manor	.15
Bridgewater	.20
Brightwaters	.10
Brockport	.10
†Brocton	.08
Brockton	.10
Bronxville	.12
Brookfield	.15*
Brownville	.09
Buffalo	.06
†Burdett	.12
Burke	.11½
Caledonia	.10
Cambridge	.10s*
†Camden	.15
†Camden	.08
Camillus	.07½
Canajoharie	.10
Canandaigua	.10
Canaseraga	.12
Canastota	.12
Candor	.15
Canisteo	.12
Canton	.10
Cape Vincent	.12
Carthage	.09
Cassadaga	.08
Castile	.12
Castleton	.14
Cato	.15
Catskill	.15
Cattaraugus	.09
Cayuga	.07s*
Cayuga Heights	.12
Cazenovia	.05s*
Cedarhurst	.12
Celoron	.05
Central Square	.14
Champlain	.13
Chateaugay	.11½
Chatham	.15
Chaumont	.12
Cherry Creek	.09
Cherry Valley	.12½
Chester	.15
Chittenango	.08
Churchville	.12
Clayton	.12
Clayville	.111
Clifton Springs	.11
Clinton	.111
Clyde	.13
Cobleskill	.12
Cohocton	.14
Cohoes	.07½
†Cohoes	.10
Coldbrook	.12
Cold Spring	.12
Constableville	.10s
Cooperstown	.15
Copenhagen	.12
Corfu	.12
Corinth	.08
Corning	.10
Cornwall	.15
Cortland	.10
Coxsackie	.15
Croghan	.09
Croton-on-Hudson	.15
Cuba	.12
Dansville	.14
Deferiet	.12
†Delevan	.12
Delhi	.20
Depew	.09
Deposit	.15
†Dering Harbor	.25*
†De Ruyter	.15s*
Dexter	.09
Dobbs Ferry	.12
Dolgeville	.0945
Downsville	.16
Dryden	.12
Dundee	.20
†Dunkirk	.08
Earlville	.17
East Aurora	.09
E. Bloomfield	.10
East Hampton	.14s*
East Randolph	.09
E. Rochester	.08
E. Rockaway	.12
E. Syracuse	.07½
Eastwood	.07½
Edwards	.12
Elba	.12
Elbridge	.10
Elizabethtown	.15
Ellenville	.13
Ellicottville	.13
Elmira	.08
Elmira Heights	.08
Elmsford	.12
Endicott	.15
Endicott	.10
†Endicott	.10
Fabius	.07½s
Fair Haven	.15
†Fairport	.08
Falconer	.05
Farmingdale	.10
Farnham	.08
Fayetteville	.07½
†Fillmore	.11
Fishkill	.15
Fleischmanns	.20
Floral Park	.10
Fonda	.10
†Forestport	.15
†Forrestville	.10
Fort Ann	.10
Ft. Covington	.12
Ft. Edward	.10
Ft. Johnson	.10
Fort Plain	.10
Frankfort	.07
Frankfort	.111
Franklin	.15
Franklinville	.09
Fredonia	.08
†Freeport	.10
Freeville	.12
Friendship	.11
Fulton	.08
Fulton	.10
Fultonville	.10
Gainesville	.12
Garden City	.10
Geneseo	.12
Geneva	.11
†Gilbertsville	.15s*
Glen Cove	.10
Glen Cove	.12
Glen Park	.09
Glens Falls	.10
Gloversville	.09
Goshen	.15
Gouverneur	.09
Gowanda	.09
Grand-View-on-Hudson	.14
Granville	.15
Great Neck	.10
Great Neck Estates	.10
†Greene	.15
†Green Island	.08
Green Island	.11
†Greenport	.12
Greenwich	.10s*
Groton	.10
Hagaman	.10
Hamburg	.09
†Hamilton	.15
Hammond	.14
Hammondsport	.13
Hancock	.15
Hannibal	.08
Harrisville	.12
Hastings	.12
Haverstraw	.14
Hempstead	.10
Henderson	.17
†Herkimer	.08½
Hermon	.10
Herrings	.12
Heuvelton	.11
Highland Falls	.15
Hillburn	.14
Hilton	.15
Hobart	.20
Holcomb	.10
Holland Patent	.111
†Holley	.08
Homer	.10
Honeoye Falls	.10
Hoosick Falls	.14
Hornell	.12
Horseheads	.08
Hudson	Note 2
Hudson Falls	.10
Hunter	.21
†Ilion	.07½
Ilion	.111
Interlaken	.15
Irvington	.12
Ithaca	.12
Jamestown	.05
†Jamestowni	.05
Johnston Cty	.15
Johnstown	.09
Jordan	.10
Keeseville	.12½
Kenmore	.06
Kensington	.10
Kinderhook	Note 2
Kingston	.11
Lackawanna	.06
Lacona	.08
Lake George	A.R.
†Lake Placid	.10
Lakewood	.08
Lancaster	.09
Larchmont	.12
La Salle	.12
La Salle	.05
Laurens	.15
Lawrence	.12
Leicester	.12
Le Roy	.12
Lewiston	.10
Liberty	.15
Lima	.10
Lisle	.15
Little Falls	.0945
†Little Valley	.10
Liverpool	.07½
Livonia	.10
Lockport	.05s*
†Long Beach:	
Summer	.20
Winter	.15
Lowville	.09
Lynbrook	.12
Lyndonville	.10
Lyons	.11
Lyons Falls	.08s
†Macedon	.12
Madison	.15
Malone	.10
Malverne	.12
Mamaroneck	.12
Manchester	.10
Manlius	.08
Mannsville	.17
†Marathon	.10
Marcellus	.10
Margaretville	.20
Marlboro	.15
Massena	.10
Mayfield	.12

†Mayville	.06¾
McGrawville	.10
Mechanicville	.12
Medina	.10
Meridian	.15
Mexico	.10
Middleburgh	.15
Middleport	.10
Middletown	.11
Middleville	.12
Milford	.15
Millbrook	.18
Millerton	.14
Mineola	.10
Minoa	.07½
†Mohawk	.10
Monroe	.15
Montgomery	.15
Monticello	.15
Montour Falls	.08
Mooers	.10
Moravia	.15
Morris	.16
Morristown	.12
Morrisville	.15
Mount Kisco	.15
Mount Morris	.12
Mount Vernon	.12
Munnsville	.11
Naples	.14
Nassau	Note 2
Nelliston	.10
Nelsonville	.12
Newark	.13
Newark Valley	.15
New Berlin	.20
Newburgh	.11½
Newfield	.15
New Hartford	.0945
New Paltz	.16
Newport	.12
New Rochelle	.12
New York	Note 5
New York Mills	.0945
Niagara Falls	.05
Nichols	.15
North Bangor	.12
North Collins	.08
North Pelham	.12
Northport	.10
North Tarrytown	.12
No. Tonawanda	.07
Northville	.12
Norwich	.17
Norwood	.10
Nunda	.12
Nyack	.14
Oakfield	.12
Odessa	.08
Ogdensburg	.09
†Old Forge	.18
Olean	.08
Oneida	.11
Oneida	.08
Oneida Castle	.11
Oneonta	.14
Orchard Park	.09
Oriskany	.111
Oriskany Falls	.15
Ossining	.15
Oswego	.07s*
Otego	.15
Otisville	.11
Ovid	.15
Owego	.15
Oxford	.17
Painted Post	.10
Palatine Bridge	.10
Palmyra	.11
Panama	.10
Panama	.08
Parish	.10
Patchogue	.13
Pawling	.15
Peekskill	.15
Pelham	.12
Pelham Manor	.12
†Penn Yan	.10
Penn Yan	.10
Perry	.12
Perrysburg	.09
Phelps	.11
†Philadelphia	.07
Philmont	.15
Phoenix	.08
Phoenix	.10*
Piermont	.14
Pike	.11
Pine Hill	.20
Pittsford	.08
Plandome	.10
Plattsburgh	.15
Pleasant Valley	.15
Pleasantville	.15
Poland	.12
†Port Byron	.10
Port Chester	.12
Port Dickinson	.15
Port Henry	.15
Port Jervis	.11
Port Leyden	.15s
Portville	.12
Potsdam	.10
Poughkeepsie	.11½
Prospect	.111
Pulaski	.08
Randolph	.09
Ravena	.15
Red Creek	.12
Red Hook	.20
Remsen	.111
Rensselaer	Note 2
Rensselaer Falls	.10
Rhinebeck	.18
Richburg	.09s
Richfield Springs	.15
Richmondville	.15
Richville	.11
Rifton	.13s*
Rochester	.08
†Rockville Center	.10
Rome	.12
Rosendale	.15*
†Rouses Point	.14
Rye	.12
Sacketts Harbor	.09
Saddle Rock	.10
Sag Harbor	.13
St. Johnsville	.10
†Salamanca	.08
Salem	.15
Sands Point	.10
Sandy Creek	.08
Saranac Lake	.12½
Saratoga Springs	.10
Saugerties	.15
†Savannah	.08
†Savona	.15
Scarsdale	.12
Schaghticoke	.12
Schenectady	.10
Schenevus	.15
Schoharie	.15
Schuylerville	.10s*
Scotia	.10
Scottsville	.10
Sea Cliff	.10
Seneca Falls	.11
Sharon Springs	.12½
†Sherburne	.17
Sherman	.08
Sherrill	.08
Shoreham	.10
Shortsville	.10
Sidney	.16
Siver Creek	.08¾
Silver Springs	Note 1
Sinclairville	.10
†Skaneateles	.10
Sloan	.09
Smyrna	.17
Sodus	.122
†Solvay	.09
Southampton	.10
South Dayton	.09
South Glens Falls	.10
South Nyack	.14
Spencer	.15
†Spencerport	.12
Spring Valley	.14
†Springville	.09
Stamford	.20
Stillwater	.12
Suffern	.14
Syracuse	.07½
Tannersville	.21
Tarrytown	.12
†Theresa	.12
Theresa	.06
Ticonderoga	.10
Tivoli	.20
Tonawanda	.07
Trenton	.111
Troy	.08
Trumansburg	.15
Tuckahoe	.12
Tully	.07½s
†Tupper Lake	.10
Turin	.10s
Unadilla	.16
Union Springs	.12s
Unionville	.15*
Upper Nyack	.14
Utica	.0945
Valatie	Note 2
Valley Falls	.12
Van Etten	.15
Vernon	.11
Victor	.10
Victory Mills	.10s*
Voorheesville	.08
Waddington	.11
Walden	Note 4
Walton	.15
Wampsville	.11
Wappingers Falls	.15
Warsaw	.12
Warwick	.15
Washingtonville	.15
Waterford	.08
Waterloo	.11
Watertown	.09
Waterville	.16
Watervliet	.10
†Watkins	.10
Waverly	.15
Wayland	.14
Webster	.122
Weedsport	.10
Wellsburg	.08
†Wellsville	.11
West Carthage	.09
West Carthage	.12
†Westfield	.10
W. Haverstraw	.14
Westport	.12
W. Winfield	.20
Whitehall	.12½
White P ains	.12
Whitesbloro	.0945
Whitney's Pt	.15
Williamsville	.06
Wilson	.11
Windsor	.15
Wolcott	.12
Woodsburg	.12
Wurtsboro	.11
Yonkers	.12
Youngstown	.10

EXPLANATION OF REFERENCE MARKS

*** A minimum monthly charge applies in all cases except where asterisk (*) is shown in connection with the rate; such reference mark denotes that a minimum monthly charge does not apply.**

"†" denotes that service is furnished by the municipality. In all other cases service is by a public utility corporation.

"s" denotes that an additional monthly charge is made, such as a service charge or demand charge.

. denotes rates based on active rooms.

Note 1: First kw. hr., 60c. Each additional kw. hr., 9c. Minimum charge, 60c per month.

Note 2: First 5 kw. hrs., $1. Next 10 kw. hrs., 13c per kw. hr. Minimum charge, $1 per month per meter.

Note 3: First kw. hr., 60c. Next 99 kw. hrs., 11c per kw. hr. Minimum charge, $1 per month per meter.

Note 4: *Demand Charge*—For first 1,000 watts of demand, no charge. For each 1,000 watts or fraction thereof in excess of 1,000 watts, $1 per month plus.
***Energy Charge*—For first 8 kw. hrs. or less, $1.20. For next 92 kw. hrs., 12c per kw. hr.**

Note 5: Covers various services, maximum gross ranging from 7c to 12c per kw. hr.

Good Roads and Fire Equipment Standardization

THE *St. Louis Globe-Democrat*, in a recent issue, calls attention editorially to the effect of good roads, in accelerating the movement for the standardization of hose couplings and other fire-fighting equipment:

"Firemen from a number of the towns of southern Illinois met at Marion, not for the usual activities in which firemen engage when they get together, but to take steps for standardizing the apparatus of the various towns. Each town has been a law unto itself in determining the size and type of its fire-plugs, hose, and other equipment. Now, however, a need is felt for a uniformity that is more than fortuitous, but why? It is because of the paved country highways that change is sought.

"Over these highways the engine-houses of different towns in the same county or in adjacent counties are not separated by a greater distance, measured in time, than many engine-houses in single large cities. For one town to lend aid to another in case of a serious fire will become systematic practice, with the apparatus of all standardized.

COMPLETED TEXACO SHEET ASPHALT SECTION OF LINCOLN HIGHWAY

Sheet Asphalt Paving on Lincoln Highway

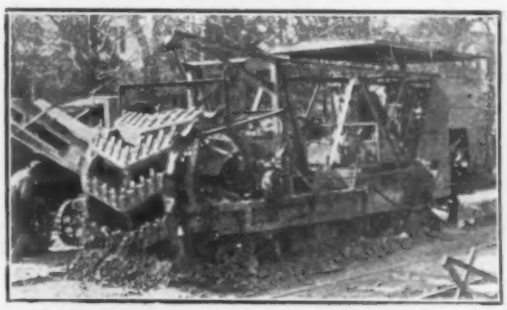
New Jersey Repaves Final Link Between Princeton and Trenton, N. J.

By Charles E. Murphy

WITH New Jersey as its eastern gateway, the Lincoln Highway, our greatest transcontinental route, extends from coast to coast through twelve states. Its length through New Jersey is 57.6 miles, beginning at the ferry slips on the Hudson River and ending in Trenton, the state capital, where it crosses the Delaware River into Pennsylvania. Much has been written on the improvement of the Lincoln Highway by the various states, but this paper will deal particularly with the final link of modern hard-surfaced pavement which New Jersey has recently completed between Princeton and Trenton. The design of this pavement was adopted after much research because of the nature of the soil and the character of the traffic it must bear.

So great has been the increased use of the Lincoln Highway in New Jersey that what was once considered heavy truck traffic has developed into convoys and carvans of high-speed trucks lasting throughout the day and night during the entire year. This route is kept clear of snow throughout the winter. On April 13, 1924, 4,789 vehicles passed a given point over a period of 16 hours. On April 11, when the number of vehicles passing in a 16-hour period was 1,946, there were 369 trucks, 180 of which were of the heavy, high-speed type, while on the day of the Princeton-Harvard football game, November 10, 1923, the traffic check showed 13,074 vehicles passing a given point on this route. Of these, 1,029 were motor trucks, 484 of which were of the heavy type. On the day of the Princeton-Yale football game, November 15, 1924, the traffic was at the rate of one car every 3 seconds.

The usual traffic which this road carries might be termed "terminal traffic," for it is the main highway between New York City and Philadelphia and over it must go those great highway transports which ply between these terminal cities. Further, between New York and Philadelphia lie such important industrial communities as Jersey City, Newark, New Brunswick, Trenton, and Camden, and travel



ROTARY EXCAVATOR RIPPING UP SURFACE OF OLD ROAD PREPARATORY TO GRADING AND RESURFACING

RAILROAD TYPE ASPHALT PLANT ON NEW JERSEY LINCOLN HIGHWAY PAVING JOB

from and to these points is far from small.

When plans were made for the reconstruction of this road, it was decided not only to build a high type of pavement, but also to improve all alignments where necessary so as to eliminate every dangerous curve. Accordingly, several sections of the route were widened and dangerous curves were wiped out at Lawrenceville, Shipetauken Creek, Brewer's Hill, and at Russell's curve near Princeton.

Detailed attention was paid to drainage and 10,000 lineal feet of storm-drains and 13,400 feet of underdrain were installed. Two old bridges along the route were torn down and wide stone and concrete bridges built in their stead. At several points along the route there were spongy places in the subgrade. These were eliminated by the addition of 700 cubic yards of cinders as subbase, carefully rolled and consolidated. The work also required the relocation and paving of about one mile of trolley tracks. The maximum grade before construction, which was 7 per cent, has been reduced to 5.5 per cent. The maximum curvature was reduced from 15 degrees to 8 degrees.

The new surface of this roadway is mostly sheet asphalt laid on a plain concrete base 8 inches in thickness. There is a 1½-inch asphalt binder course between the concrete base and the 1½-inch wearing surface. Granite block with asphalt filler on a 6-inch concrete base was laid between trolley tracks for 4,482 square yards, and a concrete surface 10 inches thick covers 19,230 square yards. The width of the sheet asphalt is 20 to 30 feet, and that of the concrete 30 feet.

The machinery and equipment used in constructing this final link of the Lincoln Highway in New Jersey represented a vast investment. Large excavators worked during the greater part of the summer of 1924 digging, ripping, and tearing away earth, rocks, and tree stumps, in order to eliminate the dangerous curves and to provide adequate drainage. A large asphalt plant of the railroad type and various models of concrete mixers were among the other features of the equipment.

Precision marked the prosecution of the work, and each step followed in scientific consequence. Even the concrete curbing was carefully broomed to clean it before the roller consolidated the asphalt surface. This was done to insure absolute evenness in rolling. As the surface was gradually completed, a scoop roller attached to a tractor followed up shortly, replacing all excavated material on the sides of the roadway, from which substantial shoulders were built to insure safety in driving.

The roadway was left open for local and necessary traffic during most of the construction. As one-half of the old highway was being excavated, graded and rolled, the other half remained open to traffic. When the first half of the new pavement was constructed, most of it being asphalt, it was ready for use immediately, and traffic was allowed to pass over it while the other half was being constructed.

With the opening of the Holland Vehicular Tunnel between New York City and Jersey City in about a year and the completion of the great viaduct and state highway passing through the heart of Jersey City, this eastern section of the Lincoln Highway will receive even heavier and more intensive traffic.

LAYING, SPREADING, AND TAMPING TEXACO SHEET ASPHALT WEARING SURFACE ON NEW JERSEY SECTION OF LINCOLN HIGHWAY

Some Dangers in Municipal Ownership to Be Avoided

By Delos F. Wilcox, Ph. D.
Grand Rapids, Mich.

Status of Municipal Ownership Movement

IN water-supply, municipal ownership is the dominant policy, although even in this utility many instances of private ownership still persist, resisting a change of policy as stubbornly as if the issue of municipal versus private ownership of water-supply were still unsettled and a subject of debate.

Gas is almost wholly under private ownership in the United States at the present time, and the policy of public ownership has made very little definite progress in this field during recent years. The telephone is so thoroughly nationalized under the control of the American Telephone & Telegraph Company that little or no practical discussion of municipal ownership of this utility is going on. In the field of local transportation, the recent adherence of Seattle, Detroit, and Toronto to municipal ownership, coupled with the longer experience of San Francisco, and Boston's recent experience with public operation have effected a very considerable change in the status of the electric railway. In particular, the experience of Detroit, for good or for ill, will undoubtedly have a great effect upon the development of the public ownership movement in this field.

But the great conflict is in the field of electric light and power, a utility with almost unlimited possibilities of expansion, profit and strategic influence in industry. In this field private interests have been waging a strong campaign everywhere, not merely to prevent the expansion of public ownership, but as far as possible to acquire or put out of business the municipal plants established in earlier years. Largely in connection with this campaign, the country has been flooded with propaganda against public ownership, and evidences are not lacking that the policy of public ownership to-day is weaker in the court of public opinion than it has been at certain times in the past.

Elements of Strength and Weakness in Public Ownership

This paper, by Dr. Wilcox, is an abstract of an address prepared by him for the 1925 conference of the League for Industrial Democracy. Another important feature of the conference was a debate on Public Ownership, between Arthur Williams, of the New York Edison Company, and Morris Hillquit, portions of which it is hoped to publish in a future issue.

Excessive Purchase Price to Be Avoided and Policy of Amortization to Be Maintained

Perhaps the most fundamental difference in financial policy between private and public ownership lies in their attitude toward the capital investment. Certainly, the increasing cost of capital under private ownership is one of the most compelling arguments in favor of public ownership. It is the tendency of private ownership, almost universally manifested, to inflate the capital account.

In all those things in which private ownership is at fault, public ownership should be as different from it as possible. So, in the capital account, public ownership should strive toward conservatism. At the outset, where an existing utility is taken over instead of a new one's being constructed, the acid test must be applied to the purchase price.

If one of the main objects of the change in policy is to escape from the excessive burdens of capital cost, it is obvious that this purpose will be wholly or in large measure defeated by the payment of a purchase price equivalent to the capital account on which the private owners were trying to earn a return. Even the normal advantage to be expected in a lower rate of interest may be sacrificed in part; for the payment of an initial price that is excessive tends to weaken the credit of the enterprise even under public ownership. The city should never for a moment lose sight of the fact that private owners, when they are converted to public ownership, have something to unload, and in effect try to impose conditions that foredoom the policy of public ownership to failure. So long as the city's credit can be found for the price, the higher the price is and the greater the initial handicap municipal owner-

ship can be put under, the better these new-found friends of municipal ownership like it.

In warning against the payment of an excessive price, I am not raising objections to the honest, prudent, and unimpaired investment, whatever that may be, but I am warning against paying for an old property the price of a new one, and against paying for a property built up under normal price conditions an amount calculated on the basis of reproduction cost in abnormal times, and against buying back franchise values that were given away and paying for overheads and intangibles that have already been paid for by the consumers through operating expenses. Undoubtedly, in most cases, it is both equitable and advantageous to take over an existing property, already rendering service, rather than to build an entirely new one that will result in the destruction of the old. But whether this advantage can be realized will depend upon the price at which the existing property can be acquired, and a city starting in on the policy of municipal ownership should not hesitate too long before undertaking to build an entirely new plant, if it is not in a position to acquire the existing one at a reasonable price.

The policy of public ownership, as distinguished from private ownership, is to diminish the capital obligations through the amortization of indebtedness. Where private utility bonds are amortized, the effect is not to diminish the capital account or the cost of capital to the public, but merely to increase the stockholders' equity. When municipal utility bonds are paid, that is the end of the interest burden on the consumers. Under stress of a high purchase price and the desire for low rates, the temptation is often present in a municipal utility to avoid amortization out of earnings if possible, or to neglect depreciation reserves, in an effort to put the municipal enterprise on a parity with similar enterprises under private ownership.

In a period of high operating costs, it may be necessary temporarily to modify the city's policy toward capital investment in order to keep rates within practicable limits, but as a matter of ultimate purpose every municipal enterprise should take pride in being different from privately owned utilities in this matter of the capital account. The constant aim should be to get the property paid for, and to provide for extensions, additions, and betterments as far as possible out of earnings, or in appropriate cases by special assessments on benefited property. Definitely, the city should set itself against the temptation not to pay for its property; and should never yield to the seductive suggestion that the capital burden should be left unimpaired for the benefit of future generations of consumers. No damage will be done if a utility plant is paid for in this generation and left as a legacy free of debt for the next one.

Municipal Utilities Should Be Self-Sustaining, But Without Discrimination Against the Small Consumers

As the primary object of a municipal utility is service, not profit, it follows that the rates charged under public ownership should not be higher than necessary to sustain the service, pay for the plant, and keep the enterprise in a thoroughly healthy financial condition. It also follows that the rates should be democratic, so as to help preserve equality of opportunity to all consumers in their domestic and business affairs. It does not necessarily follow that a municipal utility should follow strictly the Post Office rule of one stamp per letter of a given weight, no matter how far the letter is going nor how many of them are being sent out together. The making of rates is a complex problem, particularly in such utilities as electric light and power and the telephone, and it may be that the general welfare of the community will be furthered by charging different rates for different classes of service, but public policy in general is opposed to sharp discriminations in unit rates based merely upon quantity of consumption. Here, as in the matter of the capital account, the aim of public ownership should be to be different from private ownership, not merely to imitate it. The economic tendency to give to him that hath and to take from him that hath not even that which he hath is so strong, and the influences that strive to use government for the benefit of the rich and powerful are so manifold, subtle, and insistent, that there is danger often of public authorities' losing the public point of view in the operation of utilities. This is particularly true when men who do not believe in public ownership are chosen to operate municipal utilities.

In saying that as a general rule a municipal utility should be self-sustaining, I do not mean that its revenue must necessarily be derived entirely from its individual consumers. In water-supply it is now pretty clearly recognized that the cost of fire protection service is a legitimate charge against taxes and that the cost of fire protection is not measured by the amount of water used in putting out fires. Readiness to serve effectively at any time

and in any place where a fire may break out imposes a heavy cost upon a water-works system even if the fires do not break out. Then, in the matter of electricity, the importance of public lighting of streets and buildings may be such as to warrant charging against taxes a larger amount than would be justified by actual proportionate consumption of electric power.

It may be just and advantageous in many cases to relieve the consumers of all or a portion of the capital costs, by levying special assessments on benefited property to provide capital for construction. Even in the street railway business, where hitherto all but a negligible percentage of the revenues has been derived from the car riders, it might be proper to levy a portion of the cost of service upon persons or property benefited by the service without using it. Devices of this kind to distribute the cost of service according to benefits are intended merely to round out the rate schedule, not to subsidize the utility.

In this connection the question comes up as to the propriety of levying taxes upon the property of a municipal utility the same as if it were privately owned. I regard this as a question of expediency rather than of principle. The municipal utilities of Great Britain pay taxes. Most of our municipal utilities are exempt, but the Detroit Street Railway system pays property taxes as if it were privately owned, and the San Francisco municipal lines are required to set up taxes in their accounting for purposes of comparison with private operation. The Boston Elevated Railway, privately owned but leased to the state for public operation, pays taxes, while the New York subways, municipally owned but leased to the rapid transit companies for private operation, are exempted from the property tax. I think that it is better to charge taxes against the cost of service and at the same time credit the municipal utility with an appropriate amount for general services rendered to the community.

Home Rule for Municipal Utilities

Through expansion and consolidations and through the devices of holding and management corporations, the private utilities of the country quite generally have gotten away from local responsibility. They can no longer deal directly and freely with the authorities of the individual community. The local manager represents absentee owners or absentee bosses, and what he is permitted to do often depends upon how it may affect the interests of the same owners or the same bosses in communities perhaps hundreds or thousands of miles away. Outside of the financial capitals, home rule, on the side of the utilities, is hardly a memory any more, except in a few isolated instances.

Municipal ownership means the restoration of the utility to a position of local responsibility. While the public, organized and acting through local governmental agencies, cannot ignore the economic tendencies and movements of the times, and cannot blindly resist them, it can and should set itself to the conservative task of preserving local initiative and challenging every movement that tends to subvert the opportunities for local self-government and self-development. The policy of municipal ownership is to keep the city independent, with the power of self-help and the constant practice of it. This means, for one thing, that a city should always avoid the entangling contracts which promise immediate benefits but put the city in the power of some vast private interest in the future. It also means that the municipality should jealously defend its prerogative against the encroachments of state control promoted by the utilities that are trying to get away from local control.

In saying all this, I do not mean, for example, that a city should refuse to buy power of a power company when it is cheaper to buy than to generate, provided the city's future is not tied up in the process. I do not mean that a city should confine the operations of a municipal utility to the city limits, and let suburban residents and neighboring communities get along the best way they can. I think that a municipal utility should be operated generously with respect to service outside the limits of the home municipality, but that, when it supplies service to adjoining municipalities, it should as far as practicable act through the medium of their constituted authorities rather than deal directly with individual consumers.

In the matter of home rule, I mean that the city should maintain its right to build, develop and operate utility plants, finance them, and determine the character of the service to be rendered and the rates to be charged within its limits. I do not mean that the city should always be fighting the state and resisting every movement for cooperation and the protection of state interests. I think that state supervision of accounts and reports should be welcomed as a means of making definite and comparable information available to the public and of promoting effective responsibility. I think that the municipality, especially the small one,

should have the benefit of cooperation with other municipalities, and of help from expert state agencies in solving its difficult utility problems. The city should definitely refuse to be a party to the unseemly antagonism between state and local authorities in matters of utility control, and should stand for cooperation and helpfulness.

Let us have an end of this mad and unintelligent scramble for *exclusive* state control on the one side, and for *unlimited* home rule on the other. With such a fight going on, the private utilities have the situation in their own hands by the logic of the facts. Public ownership means service and cooperation, not exploitation and antagonism. Progress is an adjustment, not a revolution; and true conservatism is also an adjustment, not a reaction.

Municipal Utility Accounts to Be Kept Separate

Where one privately owned utility is operating in several municipalities, or where a local utility is subordinate to a holding or management corporation along with a lot of other utilities, or where two or more different kinds of utilities are combined in one ownership, the books of the owning or operating company seldom show the exact cost of service of the individual utility in each separate municipality.

Under municipal ownership most of the accounting difficulties that arise under private ownership on account of consolidations and absentee control are automatically corrected. With a combination of state and municipal ownership such as we find in the hydro-electric utility of Ontario, many of these difficulties remain. But even where a municipal utility is strictly local to the municipality, another set of temptations to confusion arises. In the name of economy and efficiency, certain administrative functions such as legal service, collection of revenues, purchasing, provision of office space, etc., are concentrated for all the branches and departments of the city government, and often no attempt is made to allocate the costs of such joint services, with the result that the financial report of the municipal utility is incomplete and misleading, and it may be impossible even by an accounting investigation to determine the true cost of the service.

Under municipal ownership, the city should keep each utility's accounts separate, and where concentration of administrative functions is proved to be economical and efficient, a careful allocation of costs should be made for accounting purposes.

Service, Growth and Reasonable Conservation the Aim of Municipal Ownership

It cannot be said that public utilities in this country, relatively speaking, have been backward about the investment of new capital, the adoption of modern equipment, or the expansion of the areas of service. Many illustrations could be found of each of these faults, but on the whole American utilities have been mechanically and territorially progressive.

It is often charged against public ownership that it is not progressive, that politics and red tape tend to keep municipal utilities in a state of stagnation. It is no doubt true that the people will be slow about voting bonds for the extension and improvement of a plant in which they take no interest, but if the utility is operated for service and becomes the pride of the city, it need not be handicapped for lack of funds. Municipal ownership does not fulfill its purpose unless it correlates the development of the utility with the general development of the community; for from one point of view, municipal ownership is a branch of city planning. Yet intelligent conservatism is always a good rule in municipal administration. A municipal utility ought to avoid extravagant and speculative construction, and ought not to throw away useful equipment for the newest invention until it is clearly shown that true conservatism demands the sacrifice. In other words, obsolescence is a luxury; and the city should not expect it to grow on every bush. Buy and build carefully, replace and rebuild conservatively, is a good rule for municipal ownership; and always aim to keep the capital account down, and then reduce it, and strive to eliminate it. Be different from private ownership.

Capital and Labor Under Private and Public Ownership

Public service corporations are controlled by capital. The stockholders are at the helm during prosperity, and the bondholders during adversity. In either case, money talks. Capital regards public utilities as an opportunity for profit; labor regards them as sources of jobs; when in fact they exist for the service they render to the community, and profits and jobs are necessary but incidental.

Under public ownership, capital can be kept in its "place." Being guaranteed its necessary return, its job is to take a back seat. On the other hand, labor becomes a more important rather than a less important factor. The city is interested in human welfare, and cannot properly overlook the welfare of the men who

serve it. The city is interested in lending dignity to every public employment. The enterprise belongs to the people, and the operating forces are in reality the representatives of the people.

The most practicable means of decentralizing responsibility in management and of creating a cooperative spirit and cooperative processes have not been fully worked out in practice, or perhaps in theory. But the ideal of public ownership is dignity of employment and cooperation in management, to the end that the public may be well and truly served by those who understand best the conditions of service. We cannot blink the fact that one of the essential conditions of utility service is continuity, and therefore everybody concerned in the operation of a municipal utility must give that fact primary weight, or else expect to be eliminated from participation in the conduct of an enterprise the rules of which he does not understand. The utilities must run. So, in labor relations, as elsewhere, it behooves municipal ownership to be different from private ownership, to avoid czaristic methods of administration, to enhance the dignity of labor, to organize cooperation as a guaranty of service.

Municipal Utilities Not to Be Exploited for the Glory and Profit of the Man at the Top

An objection often raised against public ownership, and against public administration in general, is the alleged unwillingness of the people to pay salaries commensurate with those paid by private enterprises for similar work. Ability and devotion to duty certainly can be secured in public service for far less than the rewards offered to the men at the top in private industry. The city should not be a slavish imitator. It should have standards of its own. True, the laborer is worthy of his hire, and rewards in public service should not be niggardly. But the city cannot afford to build up a financial hierarchy with the compensation for the few so greatly out of proportion to that of their assistants and subordinates as is often the case in private industry.

As with compensation, so with power and glory. Nothing can be more destructive of the spirit of public service in municipal utilities than a political system and habit by which a mayor elected for a short term of office is permitted to exploit the municipal utilities for his own political aggrandizement. This may take the form of political appointments, by which the personnel of the utility department is recruited from needy political workers, without regard to their knowledge or ability. A politician in public office may be defined as a man whose mind is not on his job; and in technical departments at least, such as the utilities, the city cannot afford to be poorly served by men who are all the time thinking of something else.

In another aspect of the problem, municipal ownership demands an adequate sharing and distribution of the publicity and distinction that naturally attend upon public service well performed. The man at the top must not be permitted to arrogate to himself all of the glory of achievement, but every man all down the line who has contributed his part faithfully and skillfully should participate in the appreciation felt and expressed by an informed public.

Experts and Public Opinion Under Municipal Ownership

In the utility field, the preponderance of private ownership and the vast financial interests organized to promote it and to resist effective public regulation or the extension of municipal ownership, have resulted almost in the subsidizing of the professions of engineering, accounting, law, and economics. Regulating commissions have to recruit their staffs largely from the training schools of the companies, and cities in their utility litigation have to rely to a great extent upon experts with the corporation point of view. One of the important functions of public ownership is to train experts in public service with an understanding of the public point of view and sympathy with it. The city, in the development of its municipal ownership policy, should not depend primarily on the expert advice of technical men trained to take the private point of view, but should secure the services of those who believe in making public ownership unlike private ownership, and who have the vision of service which alone justifies the public in undertaking to operate utilities.

Municipal utilities, as a matter of course, should be kept out of spoils politics, but public policies with respect to them should be determined after full public discussion, and it may be after fundamental differences of opinion have been threshed out at the polls. No function of local government is a fitter subject for broad political argument and conflict than the administration of a municipal utility. The highest success of municipal ownership depends upon the continued support of informed public opinion. Hence, those in charge of a municipal utility should always avoid the temptation to shun publicity and the challenge of public debate. The more the public knows about the business, the better it will be for

everybody concerned. This does not mean that incomplete and garbled publicity should be sought or even tolerated, but that every effort should be made to keep the public informed as to the essential facts and methods of operation.

Loose Propaganda to Be Avoided

Nothing does the cause of municipal ownership greater harm than the publication of incomplete and misleading financial reports, or the promulgation of one-sided and careless claims by the advocates of this policy. With the facts obscure, the movement to substitute service for profit as the controlling motive in the construction and operation of public utilities, can make no satisfactory progress. Let us have no loose propaganda, but clear-cut analysis and frank and full recognition of the facts. Public ownership in itself amounts to little except as an opportunity: it is in the effort to render service that democracy makes progress.

Advertising Cards Warn Criminals and Aid the Police

IN the subway, elevated, and surface cars of New York, a considerable amount of advertising space has recently been donated to an interesting campaign against criminality and in behalf of police morale, by Barren Collier, Special Deputy Police Commissioner of the City of New York. Eighteen of these law enforcement cards have been prepared at the office of Mr. Collier's car advertising firm. One series is addressed to the criminal himself, each carrying the slogan, "You CANT Win." The cards in the second series, six of which are here reproduced, have a threefold object—to show the criminal how strong are the police and how weak he is by comparison; to breed greater respect for and appreciation of the police in the minds of the people of New York; and to heighten the morale of the police through this appreciation.

READY ~
to guard your children as they would their own ~ Your New York Police /
READY ~
~ neither rain sleet nor biting winds can swerve them from the path of duty ~ Your New York Police /
READY ~
YOUR New York Police are first aid specialists /
READY ~
every second at the other end of your telephone to answer your calls and ACT / Call Your New York Police ~ Spring 3100
READY ~
to risk their lives for you and yours ~ 'all in the day's work' of Your New York Police /
READY ~
Your Safety is the chief concern of
YOUR New York Police

Copyrighted by Barron Collier

SIX OF THE EIGHTEEN CAR ADVERTISING CARDS USED IN NEW YORK'S LAW ENFORCEMENT CAMPAIGN

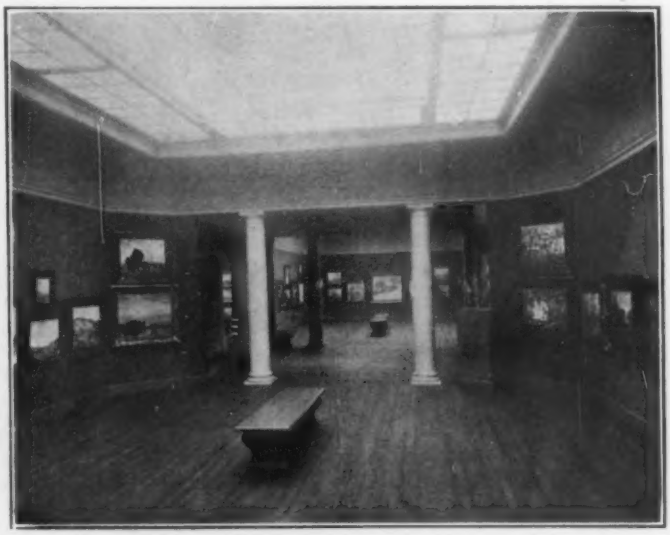
THE ART GALLERY IN LYME, CONN.

How a Town of 1,600 Secured an Art Gallery

By Estelle H. Ries

THE little town of Lyme, Conn., prides itself on the possession of one of the finest art galleries to be found in any small community in this country, and the story of how the building was acquired is an interesting and inspiring one.

During the last twenty-five years many talented artists, attracted by the delightful scenery of this section of Connecticut and by the quaint beauty and dignity of the old town itself, have made their homes in this New England farming community, and they now form a firmly settled colony of considerable size. As far back as 1902 the residents of the town, prompted by a growing interest in their new neighbors, and a natural curiosity as to their accomplishments, suggested that the artists arrange an exhibition of their work. This was held in an informal way in the village library, and was such a success, not only in the large number of out-of-town visitors that attended, but in the many art sales made, that the practice of holding an exhibition has since become a recognized annual event. As time went on and the exhibitions became increasingly large and successful, the need of a definite organization to take charge of these activities became apparent. The Lyme Art Association was subsequently incorporated, in the year 1914, and since then it has been the aim of the commu-



LOOKING THROUGH TO THE NORTH ROOM OF THE ART GALLERY IN LYME

nity to take a step further and acquire permanent quarters for the art exhibits.

That this purpose has finally been accomplished is due largely to the efforts of the artists themselves. Through exhibitions in the library, where small admission fees were charged and the proceeds divided between the library and the artists, about $6,000 was accumulated to form the basis of a building fund. As a further proof of their interest and sympathy with the movement, the artists agreed to the suggestion of some of the laymen that a certain percentage of the proceeds from the sales of their work be assessed to help enlarge the building fund. So it was arranged that on each sale amounting to $200 or more, 50 per cent would be paid to the artist in the form of a bond redeemable in fifteen years without interest, and that 50 per cent of the remaining sum would be contributed outright by the artist as a commission on the sale. In this way, and with the help of gifts from other friends of the movement, the fund was increased to more than $20,000. A site was secured, and about a year later the art gallery, plans for which had been designed and donated by Charles A. Platt, painter-architect, was completed. At the exhibition held in the gallery last year, an admission fee of 50 cents was charged, and with the income from this source, together with the proceeds from sales, commissions, teas, etc., the Lyme Art Association was able to meet all obligations and is now on a firm financial basis.

A Worth-While Investment for Any Community

Without doubt, the acquisition of an art gallery, no matter on how small a scale, is a worth-while investment for any community. It can be made to serve as a clearing-house, affording artists a place for the display of their work and giving the public an opportunity to purchase really worth-while works of art at a lower rate than is possible when the middleman's profit has to be considered. The presentation of lectures and discussions on topics related to both industrial and fine arts can be arranged, and to supplement local exhibits advantage can be taken of the fine traveling exhibits made available at a nominal charge by the American Federation of Arts. Through such an institution there would be stimulated in the people of the community not only an added appreciation of beauty, but a desire to have in their own homes examples of art. The building itself, according to its size, might serve as a community center, having a library, club rooms, lecture hall, etc.

How to finance such a structure is of course an important question, and is one that may be handled in various ways. Contributions in small amounts can no doubt be successfully solicited from the citizens in general, supplemented by larger gifts from those financially able to offer them; bonds redeemable in a short period of years might be issued; or, as in the case of Lyme, much of the first cost of the structure and its furnishings might be accumulated by the artists themselves through the proceeds of exhibits and commissions on sales. Until all obligations were cleared, small admission fees to special features in the building might be charged.

The remarkable success of the project in Lyme, with a population of only about 1,600, should be an incentive to progressive communities everywhere to erect similar structures proportionate to their needs.

To Outlaw "Jerry" Building

MUCH interest has been aroused among high-grade builders and realtors by an announcement recently made by Walter Stabler, Comptroller of the Metropolitan Life Insurance Company, of New York, of a plan to outlaw "jerry" building, through the establishment in as many cities and towns as possible of Better Construction Bureaus. In the opinion of the *National Real Estate Journal*, Mr. Stabler's proposal promises to drive the dishonest and ignorant builder out of business and pave the way to a greater future for the man who believes in giving a dollar's worth of home for every dollar he asks of his customers.

In discussing the Better Construction Bureau idea, before the recent convention of the National Association of Real Estate Boards, Mr. Stabler said, in part:

"These bureaus would be financed by the lending interests at first, but ultimately they should become self-supporting, from charges made by the bureaus to borrowing builders.

"These bureaus, I suggest, should be prepared to give specially prepared certificates to builders upon the completion of every house. A house of first-class construction and finish should be described in the certificate as a 'Class A' house. A house not quite so good should receive a 'Class B' rating. . . . Buyers would demand of builders a certificate before making purchases. I predict that, in any city where this plan is put into effect, it would not be long before all houses built with borrowed money would be constructed under bureau supervision. As a result, the dishonest or ignorant builder would either mend his ways or go out of business."

Cooperation Between Fire and Water Departments

By Frank C. Jordan

Chairman, Joint Fire Prevention Committee of the American Water Works Association, International Association of Fire Engineers and National Fire Protection Association

A BRIEF statement relative to our fire losses, and the responsibility which rests upon us in the matter of the curtailment of these losses, will place us in a better position to understand the far-reaching importance of this subject. When we realize that during the past ten years America's fire losses have more than doubled; that these losses are always passed on to the public; that our national resources are being seriously depleted by preventable fires; that the annual loss of life due to fire is more than 15,000; that our annual output for fire protection, fire loss, loss of business due to fire, etc., reaches the staggering total of more than $1,250,000,000; that this is as much an annual charge upon American business as is the income tax; and that thousands of lives can be saved and these losses reduced by hundreds of millions of dollars annually by the enactment and enforcement of sane fire protection and prevention measures, the problem at once assumes a national, vital, and imperative aspect.

The report of the National Board of Fire Underwriters, made public on May 28, shows that our fire losses during 1924 were over $548,000,000, as compared with $508,000,000 for the year 1923.

What This Staggering Total Means

The following homely illustration will give us a better conception of the meaning of this staggering total of $548,000,000. This amount of money would purchase a sufficient number of Fords of the coupé, touring, and sedan types to make a parade, or line of cars, reaching from Los Angeles to New York, with a space of not to exceed 5 feet between the cars. These cars, if comfortably filled according to rated capacity, could transport, at one time, all the people residing in Washington, D. C., Kansas City, St. Paul, Minneapolis, Buffalo, Milwaukee, Rochester, Cincinnati, Indianapolis, Louisville, Columbus, and Denver, with Pittsfield, Mass., thrown in for good measure. Possibly some would prefer to ride in a car of other make than the well-known Ford, and these people, to the total of more than 3,000,000, could be accommodated in a parallel line of cars purchased with the money which our annual fire toll costs us in the way of loss of business, public fire protection, private fire protection, etc. This line of cars could include Dodges, Chevrolets, Oaklands, Overlands, and a goodly sprinkling of Buicks, Packards, Cadillacs, Marmons, and Rolls-Royces, with one car to every 40 feet of the distance from Los Angeles to New York. As these cars would pass by in a parade continuing for 20 days of 10 hours to each day, 22 miles an hour, we should exact one life for every minute of the time as our unceasing sacrifice to the fire demon.

Negligence Should Be Penalized

The largest factors entering into this ever-increasing loss are: (1) the carelessness of the American public; (2) the lack of personal liability; and (3) the prevailing opinion that the insurance companies pay the bill.

Carelessness is the underlying cause of America's fire losses. It is estimated that 75 per cent of our fires are avoidable if ample precautions are taken. A man who has a preventable fire picks the pockets of his neighbors, either through the medium of fire insurance or of an unjustified use of the public fire department, which all must support. Fire departments are not maintained to protect a man from the results of his negligence, and when he calls upon the city in any such case he should be made to pay for this service. No civilized country should expect its firemen to risk their lives in fighting fires which are easily preventable.

The statement "fully covered by insurance" is untrue. Insurance never covers the entire loss on a home, store, or factory. It cannot replace the lost job, the loss of business, the invaluable records or keepsakes of the home, nor can it compensate in any way for the fearful loss of life, and yet our conscience is dulled by the statement "fully covered by insurance."

In a consideration of the important subject of decreasing America's fire losses, it is well to reach an understanding of the obliga-

tions which rest upon the different organizations in the matter of public fire protection and prevention.

Obligations of Water and Fire Departments and Individuals

The major obligations of the water company, or department, could well be summed up as follows:

1. To furnish pure water in sufficient quantity and at adequate pressure
2. To furnish efficient fire protection service
3. To cooperate with all recognized authorities and citizens in the campaign to reduce fire losses

The major obligations of the fire department might well be summed up as follows:

1. To assist in the prevention of fire
2. To provide adequate equipment and trained firemen so as to efficiently combat any fire
3. To render that fire service with the least possible loss in money and inconvenience to the public.

The three major duties of the citizens might well be summed up as follows:

1. To take all reasonable steps to prevent fires
2. To make adequate provision for the fire and water department, so that there may be the most effective service in case of fire.
3. To bring about that spirit of cooperation which will tend towards decreasing fire losses

The National Board of Fire Underwriters, the recognized authority in the matter of grading of cities with reference to their fire defenses and physical condition, places upon the fire and water departments relative values totaling 3,750 points out of a possible 5,000 points. In other words, these authorities place upon the fire and water departments 75 per cent of the burden of furnishing that vital protection requisite to the success of the campaign of reducing America's fire losses.

Major Fire Prevention Activities

The author's suggestions of major fire prevention activities, based upon several years of experience, are as follows:

1. Surrounding the Fire Chief with a Fire Chief's Cabinet, or Chamber of Commerce Fire Prevention Committee, giving to the Fire Chief that moral support which is essential to the program of reduced fire losses.

2. The cultivation of a broad-gaged policy in reference to the Fire Department. Adequate fire protection is dependent upon a well-equipped and well-manned Fire Department.

3. The establishment of a training school in the Fire Department, to the end that those firemen may render a thoroughly efficient fire protection service.

4. The cultivation of such a broad-gaged policy in reference to the construction and operation of the public water-supply system as will permit the building and operation of this system on the highest possible plane of efficiency.

5. A program of systematic inspection by firemen from a Fire Prevention Division of the Fire Department, supplemented by assistance from firemen from each fire-house in the city, who shall be detailed to make inspections in their immediate locality.

6. City ordinances providing for the elimination of wooden shingle roofs, and other known fire hazards.

7. Clean-up campaigns to rid the city of all trash heaps and similar fire hazards.

8. That cooperative effort between all fire protection and fire prevention agencies which will assure the city the best possible service in the program for decreased fire loss.

The success of the fire prevention movement in the United States is dependent upon the cooperation between the citizens and the fire and water departments. Without that cooperation the campaign cannot succeed.

Prevention Lags Behind Protection

For many years, engineering efforts have been expended in evolving methods of curtailing our fire waste. We have all the technical knowledge that we need for fire protection; we have costly surveys of cities, regulations for effective use of fire retardants, and devices for fire extinguishment, but we have not educated the American public to the necessity of applying this knowledge and making it pay its proper dividends in the way of a greatly decreased fire loss. It is true that much progress has been made in the matter of increasing the efficiency of the public fire service and arousing the public conscience in reference to the prevention of fire. It can be said without fear of contradiction that the public fire service of America is on a higher plane of efficiency than that of other countries of the world. Large organizations such as the National Fire Protection Association, the Credit Men's Association, and the United States Chamber of Commerce are making headway in fire prevention campaigns.

It is well worth while to refer to the tremendous change in the consciousness of firemen in the last decade. Ten years ago their dominating thought was the extinguishment of fires. The prevention of fires was but a secondary consideration. Many of them gave their lives in the fighting of fires which should

never have occurred—fires that were due to gross carelessness or neglect. That day is passing and a new day is dawning. The fireman and the people he represents are gradually awakening to a new consciousness. They realize that it is not necessary to wait until a fire occurs before beginning their fire fighting. This new consciousness speaks well for the future of our country. The new program of fire prevention lacks the spectacular features of fire fighting, but it is much more efficient in the great campaign of saving lives and dollars. The realization by the firemen and water plant operators of the responsibility which has been placed upon them in the matter of adequate protection and prevention, lays the foundation for a cooperation which should and will mean a saving of more than one-quarter of a billion dollars annually in America's fire bill.

Fire Chief's Cabinet

The following are some suggestions of cooperation between the fire chief and the water plant superintendent:

The water plant superintendent can assist in the formation of a fire chief's cabinet. Too often the fire chief must fight his battles without proper aid from the city officials, and from those who should be his strongest supporters, namely, the business men of his city.

Every fire chief in America should be supported by a fire chief's cabinet composed of representative business men, club women, city officials, insurance officials, water department officials, and others who are vitally interested in the welfare of their community. Members of this cabinet should assist the fire chief in making surveys of the city in reference to its fire protection facilities and should stand shoulder to shoulder with him in his efforts to secure adequate fire-fighting equipment and the enactment and enforcement of proper fire protection and prevention measures. They should join the chief in a careful study of the requirements of the National Board of Fire Underwriters, as they pertain to the local situation, and give heed to the suggestions of the National Fire Protection Association relative to the reduction of preventable fire waste in our country. The water plant superintendent should be a most active member of this cabinet and should be in the front rank of those working with the fire chief.

The fire chief should render all possible aid to the water plant superintendent in his efforts to furnish a thoroughly satisfactory water service. He should work with the water plant superintendent in studies of the distribution system, pumping-plant equipment, and reservoir capacity and should give all possible assistance in the efforts to secure sufficient money to make needed repairs and extensions to the public water system. It is a lamentable fact that the picture is often presented of a water plant superintendent who realizes that his plant is deficient from the standpoint of fire protection requirements, and yet is unable to secure the necessary funds for these improvements by reason of the fact that he is fighting his battles without the aid of the fire chief and the fire chief's cabinet. Such cases usually result in a serious fire loss, and too often this is followed by a denunciation of the water plant by the fire chief, when in fact the fire chief should feel humiliated because he has not rendered that helpful assistance which his position warrants.

The American public should realize that the saving of a few dollars by omitting necessary repairs in the fire or water department, the failure to purchase needed equipment, or the failure to keep all fire-fighting facilities of these two departments in good condition, may result in disaster in their community far outweighing the saving. very effort should be made towards providing reliable fire protection commensurate with the importance it deserves, and the American cities will then enjoy more freedom from fire losses.

Feeder Mains and Fire-Hydrants

The water plant superintendent should consult with the fire chief in reference to the installation of new mains and hydrants, and the fire chief should be the recognized authority in reference to the location of fire-hydrants. A "penny-wise" program in reference to the installation of feeder mains and fire-hydrants usually becomes a "pound-foolish" program when the fire department is called upon to combat a fire of especially hazardous nature. The fire chief and the water plant superintendent should work together in making flow tests and other investigations to determine the reliability of the water-supply, and a careful study should be made of the fire service around all public buildings, such as schools, public institutions, department stores, etc., to the end that the best possible service may be had in case of fire.

We frequently hear some fire chief lamenting over the fact that the city council of his town will not render assistance by the enactment of fire prevention ordinances such as

anticombustible roof ordinances, proper building laws, etc. Too often we hear the statement made by firemen that the citizens of their town disregard the orders issued by the fire department. Too often we hear the water plant superintendent lamenting over the fact that he is unable to make extensions which are necessary to provide adequate fire service. A systematic campaign of fire prevention, carried on by a fire prevention committee or a fire chief's cabinet, will so arouse the public conscience to these losses as to make possible that efficiency of fire protection and fire prevention which will bring about a reduction in the fire losses.

ACKNOWLEDGMENT.—The foregoing article was delivered as an address before the New England Association of Fire Chiefs, at Pittsfield, Mass., June 24, 1925.

Why a Transportation Survey?

By Edward A. Roberts

Fisk & Roberts, Consulting Engineers, New York; formerly Chief of Transit Bureau, New York Transit Commission

EVERY community needs a periodic survey of its circulatory system of passenger transportation, just as every individual needs a periodic physical examination. Each is an insurance against the development of serious ills that may cause irreparable damage if not given prompt attention.

In the modern city the circulation of the population between the various sections of the city is accomplished by the use of street cars, busses, taxicabs, private automobiles, and sidewalks. The city with the best system of transportation is the one whose people are able to travel from point to point with a minimum of time and cost and a maximum of comfort and safety.

To achieve the desired objects of speed, economy, comfort, and safety, the various transportation agencies must be carefully coordinated. Correct coordination avoids interference and duplication of service that loses time and is ruinous to economy. The operation of street cars and busses must be adjusted to meet the requirements of the traffic in order that no service be wasted. Nevertheless, the service these public transit agencies give must be so good that people will be encouraged to use it rather than operate their private automobiles at an expense of 6 to 12 cents per mile, with the resultant congestion and slowing down of all other traffic caused by each vehicle added to the traffic stream.

The travel habits of any community change rapidly on account of fluctuating industrial conditions, the shifting character of business and residential districts, and the continued development of busses and private automobiles. There is only one way to avoid an enormous waste of money and service in the operation and use of street cars, busses, taxicabs and private automobiles. That one way is the traffic survey which measures the demand for transit, and analyzes the travel habits of the population and the use of the existing means of circulation, from which a plan of coordinated transportation can be formulated that gives a maximum of speed and comfort at minimum cost to the traveling public.

The progressive cities of the country now follow some such program as this in order to stimulate the growth and prosperity of the entire community by keeping their transportation organization and facilities in the healthiest possible state. The cities that do not study their transit problem are the ones whose trolley routes still serve abandoned ferry terminals and give full service to factories working part time, whose bus lines run on the same streets as the trolley cars and yet leave growing sections of the city unserved, whose taxicabs block traffic by cruising around for passengers, and whose rates of fare are so high that workers use their private automobiles for traveling to and from work while trolleys run over the same route full of empty seats. That is why such cities need a transportation survey.

How Does Your 1925 Per-Capita Tax Rate Compare with 1914?

According to the National Industrial Conference Board, the average cost of living in July, 1925, was 68.7 per cent higher than in July, 1914. If your per-capita tax rate has increased more than that percentage, is your municipality rendering new or improved services to its citizens which justify the increase?

Chamber of Commerce Activities in Public Affairs

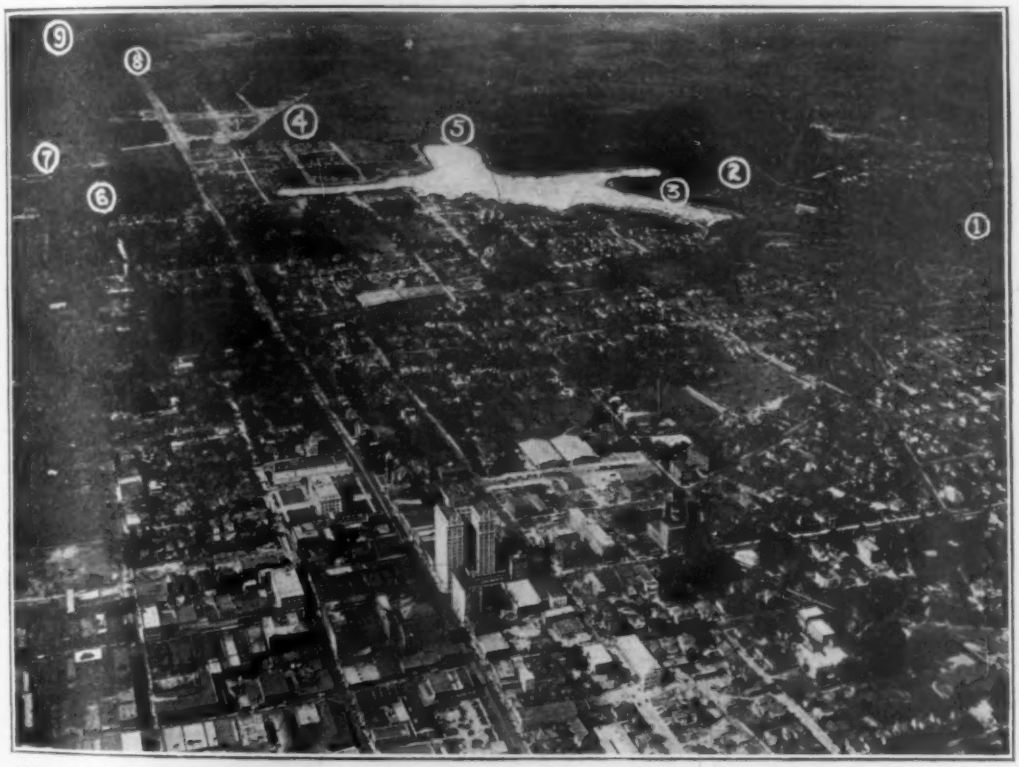
Eight Greensboro Citizens Have Donated More Than 300 Acres of Park Lands

GREENSBORO, N. C.—With a far-seeing vision of Greensboro's needs in the way of park and playground space, the Chairman of the Park and Recreation Committee of the Chamber of Commerce, Paul Lindley, devised and laid before a number of local property owners a plan for a complete park, playground and boulevard system adequate for the city for many years to come. Inspired by this ambitious plan, eight individual property owners were induced to deed to the city tracts of land aggregating more than 300 acres lying along both sides of Buffalo Creek which were needed to carry out the proposed scheme.

Surveys were then made and plans laid out to combine these donated areas with other tracts already owned by the city, making in all about 500 acres available for park development. In addition to conventional playgrounds, the plans include an athletic stadium, which is being financed by the American Legion as a World War memorial, a municipal golf course, wading pools, picnic grounds, an artificial lake covering about 40 acres in one of the important residential suburbs, and other interesting features.

City officials have approved the proposal to issue bonds to finance the development of the park project, and a committee of the Chamber of Commerce is planning a campaign to popularize this issue with the public prior to the bond election. Very little opposition to the project has so far developed, and it appears more than likely that the approval of the voters will be secured.

CHARLES M. KETCHUM,
Secretary, Greensboro Chamber of Commerce.



AIRSCAPE SHOWING A QUARTER-SECTION OF GREENSBORO AND ITS RELATION TO A 300-ACRE PARK, PLAYGROUND AND BOULEVARD DEVELOPMENT ENCIRCLING THE CITY, TIED IN WITH ABOUT 200 ACRES OF EXISTING PARKS AND GOLF COURSES

1. Junction of new park project with existing parks. 2. Site of Police and Firemen's Club House. 3. Site of municipal bathing pool. 4. Site of proposed Technical High School. 5. Daniel's Lake, 40 acres. 6. Natural park,—North Carolina College for Women. 7. College golf course. 8. Proposed municipal golf course. 9. Proposed park area

What I Should Like My City to Be Twenty-five Years from Now

LAKEWOOD, OHIO.—By asking the students of the High School and junior high schools of Lakewood to join in an essay contest on the subject of what they should like their city to be twenty-five years from now, the Lakewood Chamber of Commerce has been able to arouse in the young people a keener interest in the future of their home town and the many improvements necessary for its healthy development.

The members of the Lakewood Woman's Club, who cooperated with the Chamber to the extent of reading and eliminating the essays, reported that their task was a difficult one in view of the very high standard of the work submitted. They judged the essays from the following points: (1) Lakewood's need for the future; (2) The part the Chamber of Commerce will play in future development; (3) Systems of local government; (4) Relation of Lakewood to future development of Greater Cleveland; (5) How best to keep Lakewood a city of homes; (6) Literary style, penmanship and composition.

The Board of Directors of the Chamber personally contributed the sum of $100 to be offered as prizes, and thirty-six pupils in all received awards ranging from $15 to $1 each.

ARTHUR W. FAGERSTROM,
Secretary, Lakewood Chamber of Commerce.

Flowers for City Beautification

REDONDO BEACH, CALIF.—"Say It with Flowers" is the slogan which has been adopted for the intensive city beautification campaign which is now being waged in Redondo Beach and in which the local Chamber of Commerce is taking an active part. The campaign was recently started off by the planting of a huge geranium bed in a public place by a gathering of 150 citizens, including city officials, bankers, and professional and business men. More than 6,000 plants were set out at that time.

The local service clubs, cooperating with the Chamber of Commerce, plan to carry out the same idea in improving the appearance of the city parks, parkways, and the slopes overlooking the ocean. A plot will be assigned to each organization participating in the campaign, and competitions for the best results of their work will be held. It is planned to solicit donations of flowers, plants, and shrubs from service clubs throughout southern California, and the labor of planting and general beautification of the grounds will be handled solely by club members.

E. A. BRADBURY,
Secretary, Redondo Beach Chamber of Commerce.

REDONDO BEACH CITIZENS PLANTING A GERANIUM BED

Inducing Local Civic and Commercial Organizations to Work Together

PHILADELPHIA, PA.—Some particularly effective work has been done by the Northeast Philadelphia Chamber of Commerce in bringing about the cooperation of the local civic and commercial organizations in the territory of approximately 55 square miles covered by the Chamber. This area, which has a total population of about 250,000, including the thriving textile and industrial center of Frankford, with 55,000 inhabitants, and nineteen smaller communities, many of which are widely separated by miles of fields.

In about the year 1908 the Frankford Board of Trade, the oldest body of a civic nature in this section, was organized, but it was not until 1921 that a movement was started by some of our progressive business men to organize a Chamber of Commerce that would cover in addition to Frankford, the many surrounding smaller communities. This was accomplished the following year, when the Northeast Philadelphia Chamber of Commerce received its charter from the Commonwealth of Pennsylvania. During the first membership campaign for the Chamber, there was much unfavorable reaction to the fact that, while the organization covered all of the northeast section, the Board of Directors was composed almost entirely of Frankford men. At the next election of the Board we endeavored to correct this condition; the membership of the Board was increased from 15 to 21, and about one-half this number were elected from communities other than Frankford.

The Chamber was then faced with the task of securing the membership and cooperation of the many local civic associations in the various communities, for it was evident that little could be accomplished in the way of public improvements as long as the section remained divided against itself, as it seemed to be at that time. Arrangements were made by the Chamber for speakers to address meetings of these local groups, and finally a few of the organizations took out memberships. Others followed their example when they realized that by becoming members in the Chamber the local organizations in no way forfeited their identity, and at the following election an even greater number of outlying communities than before were represented on the Board of Directors.

The next step was the formation of what is known as the United Northeast Committee, which has as its principal aim the promotion of a spirit of coopera-

tion among the various communities of this section. Its members are made up of one representative from each civic organization holding membership in the Chamber, and a Chairman who must be a member of the Board of Directors. Meetings of the Committee are held once a month, at which time important needs of the communities which its members represent are considered, and recommendations as to appropriate action by the Chamber are prepared and subsequently submitted to the Board of Directors. The Secretary of the Chamber is required by the by-laws to submit at each regular meeting of the Committee a progress report setting forth what action has been taken by the Board of Directors on such matters as the Committee has referred to the Chamber for attention.

In the two years during which this plan has been in effect, sixteen community organizations have taken membership in the Chamber and we feel that Northeast Philadelphia to-day is a unit. Last year more money was appropriated for public improvements in this section than ever before.

CARL FISSELL,
Executive Secretary, Northeast Philadelphia Chamber of Commerce.

Where They Sing and Play Together

ASHLAND, WIS.—This city of less than 12,000 people prides itself on being in the front ranks of musical progress as compared with like communities throughout the country.

Through the efforts of the Chamber of Commerce, the City Council has appropriated $3,000 per annum towards the services of the City Superintendent of Music. Ashland's musical organizations are the following: The North Woods Band, 36 adult members in lumberjack uniform; the Symphony Orchestra, 60 members, both male and female; the American Legion Drum Corps, 32 men in army uniform; the Boys' Band, 266 members from 6 to 16 years of age, uniformed in red, white, and blue; and the Choral Club of 100 mixed voices, which produces chorals in connection with the Symphony Orchestra, and appeared on June 20 in an outdoor festival, presenting "The Messiah." These various organizations are under the direction of the City Superintendent of Music, together with an assistant, Theodore Mesang.

Invitations to a series of concerts in April and May and to the June Festival of Music were sent out to 1,500 in near-by communities. Since June 4 of this year the North Woods Band has held regular weekly outdoor concerts, and it is to be the official band at the Apostle Islands Indian Pageant, from August 2 to 16. One of the big features of the North Woods Band outdoor concerts is the community singing. Through the courtesy of the *Ashland Press*, the songs and music are printed for the use of the general public at these concerts.

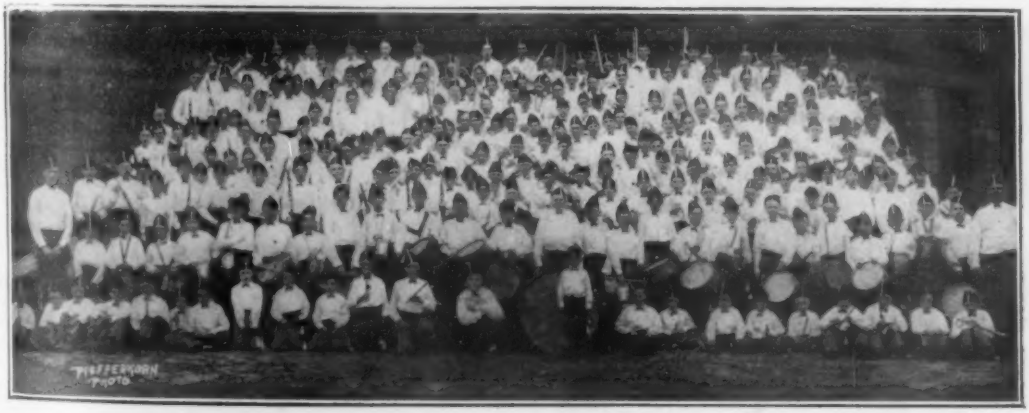
VOCAL SOLOIST ASHLAND'S BOYS' BAND

Our Boys' Band—the largest in the world — in conjunction with the Boys' Bands of 60 members from Mellen, 76 from Washburn, and 58 from Bayfield, was the feature attraction at the Indian Pageant grounds June 7. The bands were uniformed alike and played as a unit. Our Boys' Band has also been engaged for the state convention of the Elks at Superior, and for the Duluth Pageant of Progress, and will travel by special train to these engagements. Ashland also has a Girls' Hawaiian Club of 350 members. Both the boys and the girls have been featured on Pathé News reels.

T. A. STEINMETZ,
City Supt. of Music.

The Great Wastes of Planless Growth

"The great wastes that come in any metropolitan area are the wastes that few people realize. It is not the case of somebody stealing $100,000. It is in the lack of cooperation where the great wastes occur. No community, no matter how wealthy or prosperous, can afford to stand the drain that comes from headless, designless, and planless growth of a tremendous industrial and social community."—CHARLES E. MERRIAM.



BOYS' BAND, ASHLAND, WIS.

Pavement Markings Point the Way Toward Traffic Problem Solution

By Carroll E. Robb

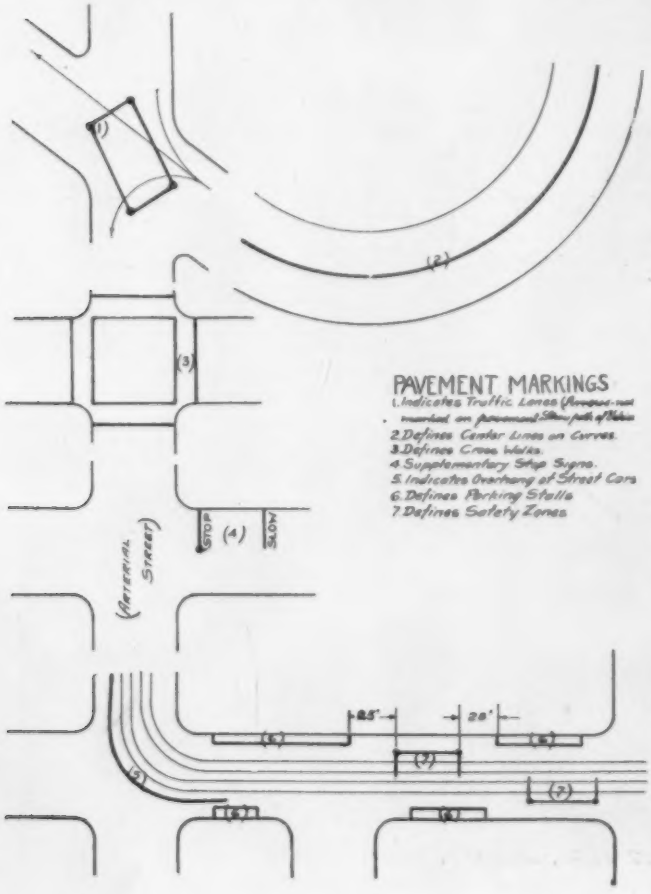
Engineer, Public Safety Division, National Safety Council

FROM studies of traffic movement and records of violations of traffic rules and regulations and safety provisions, it seems quite evident that the vast majority of vehicle operators desire to obey these regulations and requirements when they are properly understood. At ordinary vehicular speeds the drivers must quickly understand any permanent signs and instructions that are placed along streets, particularly at intersections. These instructions must therefore be placed at those points where they will be most quickly noticed and most readily understood. Pavement markings are particularly adapted to this need and should be used for directing both vehicular and pedestrian traffic. The National Safety Council recommends pavement markings:

1. To define crosswalks for pedestrians
2. To define safety zones (with standards)
3. To indicate traffic lanes at congested or irregular intersections
4. To define parking spaces
5. To supplement "stop" signs at boulevards and through streets
6. To define street center lines on curves and at other points where needed
7. To indicate the overhang of the rear ends of street cars where they make left turns

The various uses of pavement markings are illustrated in the accompanying diagram. Yellow lines may be used to direct pedestrians, and white lines to direct vehicles.

The use of a square or oblong, depending on whether the intersection is square or at an angle, has been found practicable and of benefit in efficient movement of traffic in some cities. Instead of using a button at the intersection of the center lines of the street and requiring vehicles to go around this center button, four buttons are placed on the curb lines at the center of each street. This illustration (1) shows the use of four buttons with pavement markings connecting the buttons, at the intersection of a street meeting at a sharp angle. The arrows simply indicate the direction of travel of a vehicle with respect to the buttons and pavement markings. A vehicle turning to the right would not cross the line, while a vehicle turning to the left would cross two lines and pass around two buttons. Vehicles coming from opposite directions could make left turns at the same time with this arrangement.



Pavement center line marking, as at (2), is especially desirable on curves where the vision is limited or obstructed by trees or buildings. It reminds the motorist to keep to his side of the road, thus avoiding a collision with a vehicle coming from the opposite direction.

We are coming more and more to believe that pedestrian traffic must be controlled, and that the pedestrian must walk in prescribed lanes with due regard to the rights of the motorist. Pavement markings to define pedestrian crosswalks are shown in (3). Automobiles approaching "stop" streets should be required to stop before reaching the crosswalks.

Lighted arterial "stop" signs may well be supplemented by the use of pavement markings as illustrated (4). The use of the warning sign "slow" is recommended. The "slow" pavement marking sign should be placed 100 to 150 feet from the "stop" pavement marking sign.

Street cars on turns "overhang" a considerable distance. It has been found advisable and practical to outline the extent of this overhang by the use of pavement markings. This marking is illustrated as (5). Vehicles must keep outside of this line or be struck by a turning street car.

The use of pavement markings to outline parking spaces and safety zones is recommended. Where street widths permit, standards should be used to supplement the pavement markings outlining the safety zone. Illustrations (6) and (7) show these uses of pavement markings. A minimum of 25 feet should be allowed between the ends of parking spaces and safety zones to permit vehicles to pass near the curb without interrupting the flow of traffic, thus avoiding the safety zone. It should be noted that the pavement markings for safety zones run to the center of the street. Vehicles, except street cars, should never be allowed to pass safety zones in the street-car track. They should be required to keep to the right of these safety zones.

The width of pavement marking varies in different cities from four to eight inches. Six inches should be a good standard.

The Conquest of Typhoid Fever

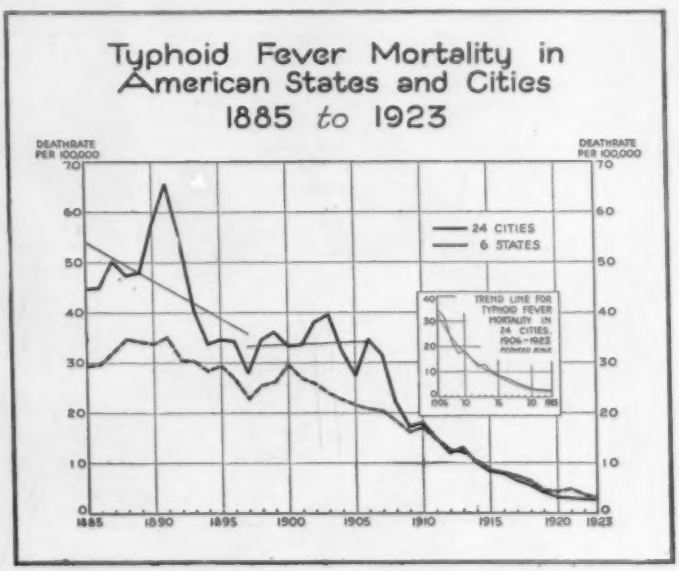
SANITARIANS and public health departments have good cause for gratification in the continued reduction of the typhoid fever death-rate as shown by figures recently made available.

In its thirteenth annual survey of typhoid fever mortality in the 69 cities of the United States that had more than 100,000 population in 1920, *The Journal* of the American Medical Association classifies the cities in geographical groups. From these statistics the accompanying table has been prepared, showing the figures for 1923 and 1924 in comparison with the yearly averages over three previous five-year periods. The deaths in each city are those reported to *The Journal* by the respective health departments. The rates have been calculated on the basis of midyear 1924 population, estimated by the method of the U. S. Census Bureau, save that in five instances, Hartford, Bridgeport, Washington, Akron, and Youngstown, the 1920 census enumeration has been used.

The Metropolitan Life Insurance Company, based on a survey of the typhoid fever problem now being made by it and soon to be published, has issued a preliminary statement, reading in part as follows::

"Four decades ago, a group of 24 American cities* had typhoid fever death-rates which ranged from 40 to 60 deaths per 100,000 of popu-

*Boston, Providence, Chicago, New Orleans, Lowell, Philadelphia, Manhattan and Bronx Boroughs (N. Y. City), New Haven, Cincinnati, Newark (N. J.), Milwaukee, Reading, Cleveland, Pittsburgh, Washington (D. C.), Baltimore, Toledo, New Bedford, Springfield (Mass.), Lawrence (Mass.), Newton (Mass.), Fall River, Scranton, Memphis.



Courtesy of Metropolitan Life Insurance Company.

lation annually. In recent years the rate for these cities averaged around 3 per 100,000! In fact, in Fall River, Mass., and Hartford, Conn., there were no typhoid fever deaths in the year 1924. Eighteen cities in 1924 had typhoid fever death-rates less than 2.0 per 100,000!

Three Steps in the Reduction of Typhoid Fever Death Rates

"There were three distinct phases in the trend of the typhoid fever death-rate for cities during the past thirty years. The first phase is described by a drop in the rate from 65.6 per 100,000 in 1891 to 28 per 100,000 in 1897. There was an average fall of 1.5 per 100,000 per year between 1885 and 1897. These years marked the extensive sewering operations of American cities, the elimination of privies and of back-yard wells and the wide extension of municipal water-supplies to homes. From 1897 to 1906, there was apparently no progress in typhoid fever control. For this second period the trend was practically horizontal (+.09 per 100,000 per year).

"Between 1905 and 1910, however, there began another era which was characterized by the strict supervision, and later by the filtration and disinfection, of city water-supplies. This soon had its effect upon the typhoid fever death-rate. In 1906, the rate for the combined populations of these 24 cities was 34.5 per 100,000, and thereafter the rate declined sharply until in 1923 the low figure of 2.7 was reached. The average fall per year since 1906 amounted to 1.8 per 100,000. The protection of water-supplies during this most recent phase of the trend of the typhoid fever death-rate was supplemented by the pasteurization of milk, the supervision of the preparation of foods in public places and of food markets, supervision of the nurturing and shipment of shell-fish, and increasing use of anti-typhoid inoculation, including millions of young men who saw army service in the late war.

Records of the States and Cities

"For 6 states* which in 1885 had a population of nearly 12 millions, and in 1923 a population of more than 23 millions, the death-rate between 1885 and 1897 showed a gradual decline. Between 1897 and 1900, the rate rose, perhaps in response to the wide-spread prevalence of typhoid fever during and after the Spanish-American War. From 1900 onward, there was a steady downward fall of the typhoid fever death-rate. For every year between 1885 and about 1911, typhoid fever mortality of these 6 states was lower than the rate in the 24 cities. But, beginning about 1911 or 1912, the rate in the cities fell faster than the rate in the states, and for each year since 1915 the typhoid rate in the cities was lower than and fell faster than the rate for the 6 states. The somewhat slower rate of fall of typhoid fever mortality in the population of the 6 states may be accounted for by the greater difficulties of sanitary control among rural populations. The most effective work in typhoid fever control is accomplished when water-supplies are filtered and disinfected and when milk and other food distribution is supervised. In 1923, the typhoid fever rate of the 6 states was 3.3 per 100,000, and of the 24 cities, 2.7 per 100,000."

*Massachusetts, Connecticut, Indiana, New Hampshire, New York and New Jersey.

DEATH-RATE FROM TYPHOID PER HUNDRED THOUSAND POPULATION

	1924	1923	1916-1920	1911-1915	1906-1910
New England States					
Fall River	0.0	4.1	8.5	13.4	13.5
Hartford	0.0	0.7	6.0	15.0	10.0
Worcester	0.5	2.6	3.5	5.0	11.8
Springfield	1.3	1.4	4.4	17.6	...
Lowell	1.7	2.6	5.2	10.2	13.9
Boston	2.1	1.0	2.5	9.0	16.0
Providence	2.5	0.8	3.8	8.7	21.5
Bridgeport	3.5	1.4	4.8	5.0	10.3
Cambridge	4.5	3.6	2.5	4.0	9.8
New Bedford	4.5	0.8	6.0	15.0	16.1
New Haven	5.1	4.6	6.8	18.2	30.8
Middle Atlantic States					
Trenton	0.8	11.8	8.6	22.3	...
Rochester	1.2	1.9	2.9	9.6	12.8
Syracuse	1.6	2.2	7.7	12.3	15.6
Philadelphia	2.2	1.7	4.9	11.2	41.7
Jersey City	2.6	1.6	4.5	7.2	12.6
Newark	2.7	2.3	3.3	6.8	14.6
Yonkers	2.7	0.9	4.8	5.0	10.3
Buffalo	2.8	4.3	8.1	15.4	22.8
Scranton	2.8	1.4	3.8	9.3	31.5
New York	3.1	2.4	3.2	8.0	13.5
Paterson	3.6	2.9	4.1	9.1	19.3
Pittsburgh	3.9	3.7	7.7	15.9	65.0
Reading	5.4	2.7	10.0	31.9	42.0
Camden	6.3	4.0	4.9	4.5	...
Albany	12.6	3.4	8.0	18.6	17.4
South Atlantic States					
Richmond	1.1	5.5	9.7	15.7	34.0
Baltimore	2.8	4.3	11.8	23.7	35.1
Norfolk, Va.	2.9	0.0	...	...	...
Washington	4.3	6.0	9.5	17.2	36.7
Wilmington	8.3	2.6	...	...	...
Atlanta	15.0	17.1	14.2	31.4	58.4
East North Central States					
Akron	1.0	1.4	...	...	...
Milwaukee	1.0	1.0	6.5	13.6	27.0
Cleveland	1.2	1.7	4.0	10.0	15.7
Chicago	1.6	1.9	2.4	8.2	15.8
Dayton	2.4	3.6	9.3	14.8	22.5
Cincinnati	2.5	3.2	3.4	7.8	30.1
Detroit	3.0	4.0	8.1	15.4	22.8
Grand Rapids	3.4	1.4	9.1	25.5	29.7
Columbus	3.7	4.6	7.1	15.8	40.0
Indianapolis	3.9	2.6	10.3	20.5	30.4
Toledo	4.4	6.0	10.6	31.4	37.5
Youngstown	4.5	7.6	...	...	...
East South Central States					
Louisville	1.9	3.5	9.7	19.7	52.7
Birmingham	7.5	7.7	31.5	...	...
Nashville	20.4	12.3	20.7	40.2	61.2
Memphis	41.2	13.6	27.7	42.5	35.3
West North Central States					
Omaha	1.0	5.4	5.7	14.9	40.7
St. Paul	2.0	3.3	3.1	9.2	12.8
Minneapolis	2.1	1.0	5.0	10.6	32.1
Des Moines	2.8	0.7	...	...	...
Kansas City, Mo.	3.6	7.1	10.6	16.2	35.6
St. Louis	3.7	4.0	6.5	12.1	14.7
Kansas City, Kan.	4.6	0.9	9.4	...	...
West South Central States					
Forth Worth	1.7	4.9	...	...	...
Houston, Texas	5.6	7.8	...	...	...
San Antonio	5.8	9.8	23.3	29.5	...
Dallas	8.2	11.6	17.2	...	...
New Orleans	10.2	8.7	17.5	20.9	35.6
Mountain and Pacific States					
Oakland	1.3	3.3	3.8	8.7	21.5
Spokane	1.9	7.7	4.9	17.1	50.3
San Francisco	2.6	3.0	4.6	13.6	27.3
Seattle	2.2	2.5	2.9	5.7	25.2
Tacoma	3.9	5.9	2.9	10.4	19.0
Los Angeles	4.4	3.1	3.6	10.7	19.0
Denver	5.1	5.2	5.8	12.0	37.5
Portland, Ore	6.1	2.9	4.5	10.8	23.2
Salt Lake City	10.1	4.0	9.3	13.2	...

How the City Manager Plan is Working---I.

Answers from Chamber of Commerce Officials and Other Prominent Business Men to an Inquiry from the Editor of THE AMERICAN CITY, Recently Sent to Cities of 10,000 to 100,000 Population Where the City Manager Plan of Government Has Been in Operation for Three Years or More

Amarillo, Texas

This city inaugurated the city manager plan ten years ago, being one of the first cities of the nation to do so. During the ensuing decade, our population has increased from 11,000 to 24,000; our tax valuations from $7,000,000 to $29,000,000; our paving from 2 miles to 24; we have built the finest municipal auditorium in Texas, at a cost exceeding $300,000, and otherwise made this a better place in which to live. Our tax-rate ($1) has not been raised.

While credit for this progress cannot be given wholly to the city manager plan, it undeniably has played an important part. Centralized authority has proved just as beneficial to public affairs as it is to private business. Under it, there is a strict accounting for public funds, and economy in their expenditure. Also, department heads are chosen because of known ability, and, like the city manager, their tenure of office depends upon their efficiency. In brief, under this plan the city's affairs are run as is a business with "service" as its motto, instead of as a political grab-box. Therefore, it has the hearty support of Amarillo citizens.

J. N. RIGGS,
President, Board of City Development.

Atchison, Kans.

The city manager plan is giving much better service; in fact, there is no comparison between the old form and the service now provided. The experience that we had with the old councilmanic form of government was simply a buck-passing game, irresponsible, without a logical head to the city government. This even applied to the matter of keeping the records. The records were kept in such shape under the councilmanic form that such things as ordinances and resolutions adopted by the City Council could not be located in the records a year after their adoption. However, this has now been entirely changed and systematic records are maintained under the supervision of the City Manager.

The City Manager works under a budgetary system. He economizes on all sides, but accomplishes constructive results and vast improvements in the city, while at the same time reducing the taxes and the city's indebtedness.

Politics are entirely removed from the commission-manager form of government; in fact, the keeping out of politics is the only plan under which this form will succeed. However, the real substantial citizens of the town themselves have even a greater obligation now than under the old plan, because upon the citizens absolutely rests the duty of seeing to it that proper men of high business and moral integrity are elected as commissioners and that these offices are not filled with wardheelers and politicians.

R. T. WILLETTE,
Manager, Atchison Chamber of Commerce.

Bakersfield, Calif.

We find a great deal of pleasure in telling you that the little city of Bakersfield under our very efficient City Manager has continued to go ahead in a substantial and very satisfactory manner.

Our development has been along common-sense business lines, our city governing body carefully weighing and analyzing their problems, with the final result that we have what can be termed a most desirable business administration.

Perhaps our paving program, extension of electrolier systems, with the saving in cost of electricity, likewise the modernizing of our fire department and bringing it up to a high state of efficiency at a very reasonable cost to the taxpayers, are our outstanding activities.

HARRISON ELLIOTT,
Secretary, Civic Commercial Association.

Bay City, Mich.

To my mind, the city manager form of government, effective here since April 1, 1921, is 100 per cent more efficient than the old aldermanic form, because business is conducted similar to a private corporation, concentrated under one head instead of being divided up under a number of department heads. Business is handled in a more efficient and economical manner, the bulk of it being taken care of each day instead of waiting for council action, which under the old form sometimes took weeks and months to get final results.

Taxes for the year 1921 were more than for 1920, but this was due to the fact that certain overdrafts and also old book accounts were raised by general taxation so as to relieve the city of some of its old debts. Since that time the general city budget has been decreased something like $143,000—$100,000 for 1922, $20,000 for 1923, and $23,485.43 for 1924.

Our bridges are in better shape than they ever were before, with practically the same expense. Our highways are also in better shape than they have ever been, with the same expense.

Several of the old departments have been consolidated without disturbing the efficiency of other departments, thereby making quite a saving in salaries. We have motorized all the fire trucks and have practically motorized the highway department. This will give you some idea of the

progress we have made under this form of government.

OTTO F. LOUIS,
President, Bay City Chamber of Commerce.

Bluefield, W. Va.

Bluefield, a city of approximately 20,000 population, four years ago adopted a charter providing for the city manager form of government. Under this form, the city has made more progress in four years than it had made in ten years previous. The city government has built miles of paved streets, miles of storm and sanitary sewers, and maintained city institutions in first-class condition, with reduced tax rate.

Speaking for the business interests of the city, I feel free to state that we consider this form of government a splendid success, though, of course, there have been the usual number of soreheads, disappointed office-seekers, and criticism of one kind or another; but in general, the plan has been successful.

HERBERT MARKLE,
President, Bluefield Chamber of Commerce.

Clarksburg, W. Va.

It is a pleasure indeed to pass favorable comment on our city-manager form of government. I think we feel very much as the children of Israel must have felt when they finally emerged from the wilderness. The general appearance of the town, especially the business center, is the most marked example of "before and after taking" I can conceive of.

The running of the city upon a strictly business basis and the efficiency of the several departments of our city government is evidence enough of the success of the management, as well as our present city charter.

S. R. BENTLEY,
Ex-President, Clarksburg Chamber of Commerce.

Colorado Springs, Colo.

After five years of city manager administration, most of our people are thoroughly "sold" on that form of government for municipalities. Without any material increase in taxes, the city during the last five years has laid 10.83 miles of new paving; installed 14.3 miles of ornamental street lights; put in 240,697 feet of curb and gutter; and erected a municipal auditorium costing $500,000 which will seat 3,500 people and has proved ideal for conventions. It also has paved 1.54 miles of alleys in the business section of the city. Three new Junior High Schools have also been built.

To the material improvements which have made Colorado Springs a better place in which to make a home, must be added the better morale among the city employees. There is a better spirit of cooperation noticeable to the man on the street. It is demonstrated repeatedly by crews at work on the streets, who do not quit just as the whistle blows for six o'clock if by working a few more minutes they can complete the job.

Colorado Springs selected a home-town man for its first manager when the new form of government was adopted in 1920, and has clung to him since. He was not a man specially trained for the job, but he brought years of successful business experience to the administration of the affairs of his city. He has applied the same principles to the government of the city—and figures talk for themselves.

R. O. GIDDINGS,
Colorado Springs, Colo.

Dubuque, Iowa

The city manager form of government in Dubuque has been in effect since April, 1920, and is a great success. It is responsible for our city affairs being efficiently administered and for much of the progress which this city is making.

When the manager form of government became effective in Dubuque, the administration found many of the municipal funds for the current year already exhausted. It was necessary to map out an economical policy and adhere to it. A saving of $2,500 per month was immediately effected by the abolishment of unessential positions.

Four hundred and fifty thousand dollars' worth of delinquent taxes were unearthed, and an organization was perfected with the assistance of the Chamber of Commerce which resulted in over $300,000 of delinquent taxes being collected almost immediately, and the balance will be paid shortly. This was one of the greatest achievements of the new plan.

Police court fines and costs for the five-year period previous to the adoption of this plan averaged $1,371. The first year after the appointment of a police judge, $12,562 in fines and costs were collected. Last year the total reached $18,209, and through the increase in efficiency of the police department, crime in Dubuque has been reduced to a minimum.

Under the old plan the fire department was inefficient. It was speedily reorganized, however, following the advent of the City Manager, and Dubuque has to-day one of the most completely equipped fire departments in the country. Fire losses have been reduced to an average of approximately $50,000 per year since 1920. This is especially significant in view of the fact that for the ten years previous the average annual fire loss was $265,373.

Dubuque last year won first prize in its class in the Inter-Chamber Fire Waste Contest, and this year we were given honorable mention. The city has been reduced from a Class Six to a Class Three city for purposes of fire insurance rate-making, according to the system of rating in the National Board of Fire Underwriters.

The city has a first-class health department; street improvements are being made and the best of pavements is being laid at prices far below those in effect in the average city; sewer- and water-mains have been extended; and in every department of our municipality taxpayers are getting 100 per cent value for every dollar of taxes which they pay.

So many things of outstanding merit have been accomplished in Dubuque that much more could be said than is mentioned in this letter. We are heartily in favor of the city manager form of government and believe that it is the only effective means of administering the affairs of the modern municipality. This sentiment prevails in Dubuque not alone among business and professional men but among all other classes.

CHAS. E. WARD,
President, Dubuque Chamber of Commerce

East Cleveland, Ohio

We consider ourselves extremely fortunate in having a charter that gives us the privilege of the city manager form of government, and we all feel very well satisfied with our efficient management. I can assure you that we would not want to go back to the old political form.

M. J. GLEASON,
President, East Cleveland Chamber of Commerce.

El Dorado, Kans.

Since El Dorado adopted the manager plan, it has thrown away its rubber stamp, "Unpaid for Want of Funds."

That probably is its outstanding achievement. It is especially noteworthy in view of the fact that the new plan was adopted on the heels of an oil boom that trebled the town's population in a year's time and necessitated improvements that ordinarily would have been scattered over a decade or more.

The 1925 report of the City Manager shows that in January, 1921, our bonded indebtedness was $1,050,756. To-day, it is $657,809. In 1921, it was necessary to issue $56,000 in refunding bonds. To-day there is a cash balance of $76,000, with no unpaid warrants outstanding. All of the outstanding bonds are in serial form—there are no sinking fund bonds. The municipal water plant is not merely paying its own way—it has paid for $30,000 worth of permanent improvements and this year will retire $19,000 of water bonds.

And this city has progressed while reducing its debt. It has paved 22 miles of streets; built sanitary and storm sewers and a modern disposal plant; installed a white way system; built a memorial auditorium; modernized its street, fire, and police departments; takes better care of its health and welfare work.

"Is the manager plan more beneficial than the previous form?" I'll tell the world it is.

F. H. CRON,
President, El Dorado Chamber of Commerce.

Escanaba, Mich.

We have had a city manager form of government in Escanaba for three years and it has been outstanding successful. Never in Escanaba's history have our people received so much for their tax dollar as during the past three years.

Escanaba owns three utilities—water, gas, and light. Under our old form of government it seemed to be impossible to operate these utilities at a profit. Under our present form of government the utilities have been operated with a handsome profit in spite of the fact that utility rates have all been reduced from 15 to 20 per cent.

During the past three years more public improvements have been made in Escanaba than during any previous ten-year period, without an increase in our tax rate. In fact, our taxes have been slightly reduced.

Because of the efficient manner in which our government has functioned, public confidence has been established to a degree never before realized. Our citizens are able to secure immediate audience with our City Manager, and their complaints and suggestions are given immediate consideration. There is no "passing the buck."

We are highly pleased with our present form of government and firmly believe that there is none better.

A. J. YOUNG,
President, Escanaba Chamber of Commerce.

Grand Rapids, Mich.

We adopted the commission-manager form of city government in Grand Rapids in April, 1917, and have been operating under it ever since. In my opinion, the outstanding features of this form of government are the centralization of authority and responsibility, making it impossible to "pass the buck" in connection with irregularities or shortcomngs. It attracts a higher caliber of citizenship to public life, and partisan politics are completely eliminated and forgotten. We never ask what the party affiliation is of any candidate for the city commission. There is no desire in Grand Rapids to return to the old aldermanic form of municipal government.

RAY E. BECKER,
President, Grand Rapids Association of Commerce.

Greensboro, N. C.

Greensboro was for years operated under a charter providing for councilmanic government. It was probably no better nor worse than a great many other cities operating under the same form of government. About four years ago a charter providing for a commission form of government was adopted and about a year later it was amended to provide for a city manager. From the outset the Council was composed of the city's outstanding business men, all of whom were conspicuously successful in their private enterprises. Under their businesslike direction the city has made remarkable progress.

During the year ending May 30, 1924, $2,528,613.54 was spent for permanent improvements. During the year ending May 30, 1925, $3,540,511.51 was spent for permanent improvements. The tax-rate in both years was $1.24 per $100 based on 60 per cent of the valuation.

The success of any form of government, of course, may be measured by the character and ability of its administrators. The remarkable achievements of the city of Greensboro are due not so much to the form of government as to the men who have given unselfishly of their public service for the benefit of the city.

L. H. HOLE, Jr.,
President, Greensboro Chamber of Commerce.

Kalamazoo, Mich.

The commission-manager form of city government has a long list of accomplishments in Kalamazoo to its credit.

Under the old council form, aldermen always came into office pledged to economy policies, and little progress was made in the broad terms of public service. Police and health departments were kept at the lowest state of efficiency because not enough money was made available for adequate help to maintain them. Provision for the city's share of pavements and sewers was very meager; hence very few such improvements.

There was also, under the old form, the policy of bonding for the city's share of these improvements instead of including such expenses in the annual appropriation. Upon the advent of the new form of government the interest charge on this kind of debt was $33,000 per year. Immediately, this policy was changed, and such money as is needed for the city's portion of these improvements is now raised by direct tax. Old bonds have been retired, until at present there is required for yearly interest only the sum of $9,600,

and the general fund debt has been reduced to $200,000 from the old sum of $423,000.

The police and fire departments have been brought up to a wonderful state of efficiency, fully manned and completely motorized. The health department was immediately rehabilitated, with a full-time health officer and city physician and a complete staff of visiting nurses. The accounting system was revised and perfected. Centralized purchasing was inaugurated, and more than one hundred acres of park land acquired. A municipal plant for the manufacture of asphalt paving top has been installed, whereby more than $50,000 saving has been effected for property owners over old rates for paving top. Many other instances of accomplishment might be mentioned, tending to show the advantage of the commission-manager form in Kalamazoo.

GUY P. WILSON,
President, Kalamazoo Chamber of Commerce.

(To be continued in the October number)

Hints, Helps and Happenings

Estimated Populations as of July 1, 1925

FOR 72 of the largest cities of the United States the Bureau of the Census has made public its estimate of population as of July 1, 1925. These estimates are based upon the assumption that the increase each year since 1920 is equal to the annual increase from 1910 to 1920, as shown by the returns of the two Federal censuses, allowance being made for the population of any annexations or detachments of territory that may have taken place, of which the Bureau has been advised. Several important cities were not included in the list pending the establishment of more satisfactory figures.

Albany, 119,679.
Baltimore, 796,296.
Birmingham, 205,670.
Boston, 783,166.
Buffalo, 553,828.
Cambridge, Mass., 112,444.
Camden, N. J., 128,642.
Canton, Ohio, 106,260.
Chicago, 2,995,239.
Cincinnati, 409,333.
Cleveland, 936,485.
Columbus, 279,836.
Dallas, 193,450.
Dayton, 172,942.
Denver, 280,911.
Des Moines, 149,183.
Duluth, 110,502.
El Paso, 104,929.
Fall River, 121,156.
Flint, 130,316.
Fort Worth, 154,847.
Grand Rapids, 152,698.
Hartford, 160,197.
Houston, 164,954.
Indianapolis, 358,819.
Jersey City, 315,280.
Kansas City, Kans., 123,-743.
Kansas City, Mo., 367,481.
Louisville, 259,259.
Lowell, Mass., 116,421.
Lynn, Mass., 104,704.
Memphis, Tenn., 174,483.
Milwaukee, 509,192.
Minneapolis, 425,435.
Nashville, 136,220.
Newark, N. J., 452,513.
New Bedford, Mass., 135,-132.
New Haven, 178,927.
New Orleans, 414,493.
New York, 6,103,384.
Oakland, Calif., 253,700.
Omaha, 211,768.
Paterson, N. J., 141,695.
Philadelphia, 1,979,364.
Pittsburgh, 631,563.
Portland, Ore., 282,383.
Providence, 245,112.
Reading, Pa. 112,707.
Richmond, Va., 186,403.
Rochester, 331,530.
St. Louis, 821,543.
St. Paul, 246,001.
Salt Lake City, 130,948.
San Antonio, 198,069.
San Diego, 100,347.
San Francisco, 557,530.
Schenectady, N. Y., 102,-161.
Scranton, 142,266.
Somerville, Mass., 102,-073.
Spokane, 108,897.
Springfield, Mass., 152,-578.
Syracuse, 191,559.
Tacoma, 104,455.
Toledo, 287,380.
Trenton, 132,020.
Tulsa, Okla., 124,478.
Utica, 107,173.
Washington, D. C., 497,-906.
Wilmington, Del., 122,-049.
Worcester, Mass., 198,883.
Yonkers, N. Y., 111,717.
Youngstown, 159,870.

Motor Vehicle Registrations More Than 13 Per Cent Higher Than a Year Ago

MOTOR vehicle registrations in the United States totaled 17,548,377 on July 1, 1925, a gain of 2,108,407, or 13.7 per cent, over July 1, 1924, according to a survey just completed by *Automotive Industries*.

Registrations at the end of the first six months of this year were nearly as high as the 17,605,501 recorded on December 31, 1924, as the total for the whole of last year. Total registrations at the end of the year are certain to surpass those of 1924 by a good margin, indications now being that the December 31, 1925, figure will be very close to 19,000,000.

Fees paid into the various state treasuries by automobile owners for vehicle licenses totaled $218,333,826 for the first six months.

The number of motor vehicles continues to increase faster than the population. There are now in the United States 6.47 persons per motor vehicle, as compared with 7.2 a year ago. California continues to lead, with 3.1 persons per car. Last year only California, Iowa, Nebraska and Nevada had less than five persons per car. This year sees the addition of Florida, Kansas, Oregon, South Dakota, Indiana, Colorado and Minnesota, which have an average of one motor vehicle for every family in the state, if we consider the average family as consisting of 4.5 persons.

Growing Sentiment for Community Advertising in Florida

THE principle of including in tax levies sufficient money to cover the advertising needs of communities, wholly or in part, now has the approval of a substantial majority of the people of Florida. It has been indorsed and utilized by the more progressive cities and counties of the state for several years.

Enabling acts of a local character, permitting the use of tax money for advertising purposes, were passed by the recent Legislature, for nearly forty communities which have not had this privilege heretofore. It is conservatively estimated that the amount expended for advertising by various towns, cities, and counties of Florida, during

the 1925-26 season, will be nearly $2,000,000, and that more than half of the sum will be supplied by taxation. . . . . .

Concrete and definitely traceable results from properly directed community advertising have rapidly built a public sentiment in Florida favorable to its support by taxpayers, thus placing the cost equally on all citizens in proportion to their taxable wealth.

—From an article by Jefferson Thomas on "The Florida Idea of Community Advertising" in *Printers' Ink* of July 2, 1925.

Assistance Available from American Community Advertising Association

At the recent convention, in Houston, Texas, of the Associated Advertising Clubs of the World, there was organized the American Community Advertising Association, to continue and enlarge the work formerly done by the Community Advertising Department of the Associated Clubs. The officers elected were: C. F. Hatfield, President, St. Louis, Mo.; R. A. Warfel, First Vice-President, Columbus, Ohio; W. M. Symon, Second Vice-President, Kansas City, Mo.; and Don E. Mowry, Secretary-Treasurer, Madison, Wis.

In a letter to THE AMERICAN CITY, Mr. Mowry says:

"We are aiming to stimulate interest in community advertising and will take members from all walks of life, including chamber of commerce secretaries, city officials, members of advertising clubs, etc. We hope to strengthen the work, with increased membership, so that a regular bulletin may go out to those interested. We are trying to bring about the use of more scientific methods by communities for advertising their cities, states, or districts."

On application to Mr. Mowry, readers of THE AMERICAN CITY can secure three documents which are available for free distribution. These are papers read at the Houston convention by Charles F. Hatfield on "Growth and Development of Community Advertising" and by W. B. Weisenburger on "Municipal Advertising That Pays"; and a summary of a paper on "Community Advertising" by James Heaton, given before a recent convention of the New England Association of Commercial Executives.

Cleveland Street Lighting

CLEVELAND, Ohio, is said to be the first city to adopt lighting units equipped with 25,000-lumen or 2,500 candle-power Mazda incandescent lamps. It is on Superior Avenue on which 220 new units will be installed, composed of large suspended Novalux 23-B lanterns made by the General Electric Company.

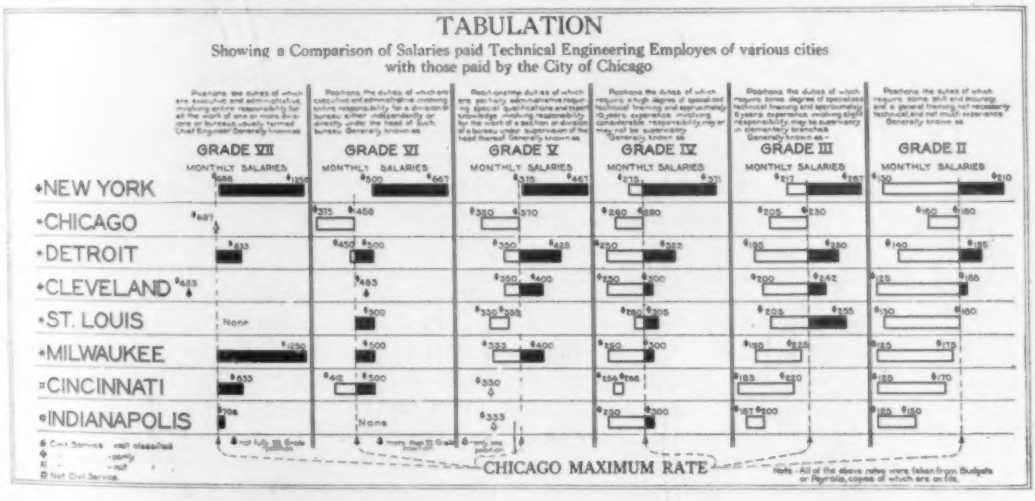
A New Endeavor in the Tuberculosis Field

ON June 26 the corner-stone of the Ida Potts Memorial Hospital, located in the town of Livingston, Columbia County, N. Y., was laid. This hospital will render a unique service to the tuberculous in that suitable patients who have had their disease arrested but who are unable to return to work will be able to receive expert advice and treatment to bring about their permanent rehabilitation.

The ultimate objective of the Board of Managers is the development of a colony similar to Papworth Village in England where the arrested tuberculous can earn a livelihood under normal community circumstances with the additional advantage of expert medical supervision.

—*Health News*, New York State Department of Health.

Salaries Paid by Certain Cities to Technical Engineering Employes



From a recent pamphlet of the Engineering Employes' Association of the City of Chicago

The pamphlet in which this tabulation appears makes a strong plea for more adequate compensation of technically-trained engineers in municipal service. This plea is based on two fundamental facts: "1. That the engineer's salary is not adequate when referred to the scale of 1913 corrected by the present price index of living commodities and that the salary is not adequate to provide a living commensurate with such activities as are inseparably a part of the existence and scientific growth of the engineer. 2. That the engineer, with his scientific training, renders the city services which are indispensable, and that the present and future physical welfare of the municipality are dependent upon and reflect the quality of such engineering service"

Legal Aspects of Trunk-Line Roads Through Cities and Villages

By Samuel K. Markman
Attorney at Law, Chicago, Ill.

THE trunk-line paved road has become a large and formidable factor in the transportation of freight and passengers. The term "trunk line" is a misnomer unless natural terminal points are provided and a continuous line of hard-surface pavement is constructed between them. In order to make the many lateral highways available for general and effective use, it is essential that trunk-line roads be constructed between main and important terminal points connecting directly or indirectly with the numerous lateral highways along the line or in the vicinity of the trunk-line road. A trunk-line road falls far short of its purpose if it is not constructed through important intermediate cities and villages.

The failure of state legislatures to authorize state and county highway officials to coordinate with municipal authorities in the construction of trunk-line roads partly lying in cities and villages, of proper strength and width and with due regard to grade and drainage, without resorting to the many subterfuges now employed, is a problem confronting state and county highway officials which must be solved, if the highest and most useful purpose such roads can be put to is to be achieved.

In the state of Illinois, state aid roads are all roads or bridges constructed, repaired or improved at the joint expense of the state and of any county or counties within the state. Public highways or sections thereof, including bridges, may be laid out, improved, or constructed at the joint expense of the state and of any county within the state, except that such aid cannot be extended to the construction of roads lying through cities or villages having a population of 20,000 inhabitants or more in Cook County, or 2,500 outside of Cook County, as shown by the last Federal census.

It is out of reason to construct an 18-foot pavement of the type commonly built in the rural districts through a city or village having a population in excess of 1,500 or 2,000 people. Trunk-line roads are usually routed through municipalities with a view to their being constructed either along the main highway or intersecting the main highway or highways. Necessarily, the standard specification adopted by state and county for the construction of state aid roads cannot be employed in the construction of city pavements. For all practical purposes the state aid country road is built on top of the ground. The grading, except in unusual cases, is a minor matter. Cities and villages by ordinance fix the grade of public highways, and pavements of necessity must be built in conformity with the requirements of such ordinances. State aid roads running through cities and villages should be reinforced, built to grade, and of a greater width than 18 feet.

The larger the population of a given city or village, the more desirable and necessary it becomes to place the municipality on the route of a trunk-line road. In the construction of trunk-line roads through cities and villages where the pavement is to be more than 18 feet in width, properly graded and reinforced, toward the cost of which state or county is to lend aid, the subterfuges referred to are immediately invoked. The municipality proceeds to institute proceedings for the construction of the entire pavement through the municipality under a specification fixing proper grades and providing for reinforcement and curb, as well as alley and street returns, the adjustment of manholes and catch-basins, and the construction of new manholes and catch-basins where necessary, and the inlets thereto. The activities of the municipality are governed by local improvement laws, under the terms whereof the cost of construction is paid by special assessment or special taxation, or both. If the owner of a lot or tract of land assessed or taxed for the pavement does not pay the assessment, the land in due course may be sold for taxes. Each step required to be taken by the municipality in the matter of obtaining a confirmation of the special assessment or special tax and extending down to the construction of the improvement in substantial conformity with the requirements of the specifications contained in the ordinance, constitutes one of the due processes of law by which property may be had or taken. This renders imperative compliance by the municipality with all the requirements of compli-

cated statutes, which teem with red tape. There are no provisions in local improvement laws for the joint construction of a pavement through a municipality by state, county, and municipal officials. When the assessment or special tax is confirmed for the cost of the particular pavement, the county superintendent of highways arranges to have the city or village advertise for bids for the entire pavement to be constructed in the municipality, to be received the same day county bids are to be opened. Bear in mind that the municipality is advertising for bids for the construction of the entire improvement—full, final, and complete. The county advertises for bids for the construction of an 18-foot strip through the municipality under the state and county specification, which differs from the specification contained in the municipal ordinance. Prior to the spreading of the assessment for the cost of the municipal pavement, the county superintendent of highways estimates the cost to the county of constructing the 18-foot strip through the municipality under the state or county specification, and the municipal officer or commissioner spreading the assessment roll for the municipal pavement levies a public benefit against the municipality for the amount to be contributed by the state or the county. The municipality receives and accepts bids and proceeds to make an award of the contract for the entire improvement to the lowest responsible bidder. The county commissioners or board of supervisors then proceed to open bids for the cost of constructing an 18-foot strip under the state or county specification through the municipality. Of necessity, its award must be to the contractor whose bid has been accepted by the municipality for the entire improvement, otherwise the improvement cannot be built.

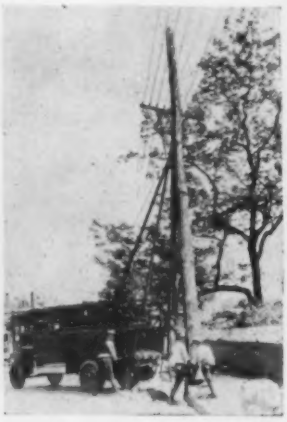
To complicate matters all the more, most local improvement acts provide that where an improvement is to be paid for by special assessment or special taxation, or both, a majority of the property owners assessed for the improvement after a bid has been accepted, may within ten days after notice of award has been posted, take over the construction of the improvement, provided they agree to do the work for 10 per cent less than the amount of the accepted bid. This rarely happens, but if it does, the lowest bid which has been accepted by the municipality is automatically thrown out, and unless the property owners who take the contract for the construction of the entire improvement from the municipality obtain an assignment of the county contract, the improvement cannot be made. If the same person is awarded both city and county contracts, the improvement is constructed under the joint supervision of county and municipal engineers or inspectors employed by both. The municipality usually pays its share of the cost of the improvement in bonds issued to anticipate the collection of the special tax or special assessment, or both, as the case might be. The county or the state pays in cash. From the latter the contractor receives a sum equivalent to the estimated cost of building an ordinary standard 18-foot road through the municipality. Upon receipt of this money, he executes a double receipt—one to the county for the sum due under his contract with it, and one to the municipality for the amount of the public benefit levied against the municipality. The county is through, but the municipality must file a certificate in the court where the assessment was confirmed, certifying to the cost of the improvement, as well as to the fact that the improvement has been constructed in substantial conformity with the requirements of the ordinance. There is a hearing on this final certificate, and when the court finally finds the facts stated in the certificate to be true, municipal authorities are permitted to proceed in due course with the collection of the special assessment or special tax levied for the cost of the improvement.

Where trunk-line roads are constructed without reference to grade or drainage through settlements in unincorporated territory or small cities and villages under a state or county specification, we often find pavements higher than sidewalks. Consequent difficulties with storm-water are more easily imagined than described. Such pavements are a detriment to property owners, and means must be found to drain future pavements through such settlements or municipalities and properly grade them.

Road and Bridge Laws

The road and bridge laws should be modified or amended in such manner as will permit decent cooperation and coordination between state, county and municipal authorities in the construction of trunk-line roads through settlements and municipalities. Instead of levying a public benefit against a municipality for the amount actually to be contributed by the state or the county, provision should be made for a public benefit equivalent to the cost of the ordinary 18-foot path against the county, and such sum ought to be contributed in cash by the county to the

City of Richmond reduces emergency repair time 75% with Autocar



One, two, three, and up she goes! Before putting this winch-equipped Autocar Truck in service, the City of Richmond used a crew of seven men to set up 35-foot poles by hand. With the Autocar only three men are required. It recently set up a 26-inch square, 45-foot concrete pole as easily as it handles wooden poles. On another occasion it picked up and set ten poles in half an hour.

A few weeks ago, during a storm, two large trees were blown against the electric transmission line to the city pumping plant, putting it out of commission. With the water low in the reservoir, and fire danger intensified by the electric storm, quick action was necessary. Although one of the trees was down a hill, 50 yards from the road, the Autocar and its regular crew had the line working again in one hour and ten minutes, and the work was done without breaking the line mechanically. Before getting the Autocar, the quickest time for making such repairs was four hours.

The Autocar Company, Ardmore, Pa.

ESTABLISHED 1907

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*Atlanta	*Chester	*Fresno	*Newark	*Pittsburgh	*Schenectady	West Palm Beach
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*Baltimore	*Cleveland	*Indianapolis	*New Haven	*Reading	Shamokin	Wilkes-Barre
Binghamton	Columbus	*Jersey City	*New York	*Richmond	*Springfield	Williamsport
*Boston	*Dallas	Lancaster	*Norfolk	*Rochester	*St. Louis	*Wilmington
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* Indicates Direct Factory Branch

Autocar

gas *and* electric trucks

EITHER OR BOTH - AS YOUR WORK REQUIRES

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municipality. The county would be protected if the local improvement act, as well as the road and bridge laws, contained provisions providing for county as well as municipal inspection during the construction period. The road and bridge laws should also be amended so as to make it mandatory on the part of state or county authorities to construct state aid roads through settlements (in unincorporated territory) and cities or villages, with due regard to drainage and grade. A special tax should be levied against abutting property in unincorporated territory to pay for the cost of grading, reinforcement, and possibly additional width of pavement. Municipal authorities can take care of this under local improvement laws.

Taking into consideration the fact that the greater part of state license fees are paid by automobile owners in cities and villages, the laws in all states ought to be amended so that state or county aid can be extended toward the construction of trunk-line roads through cities and villages regardless of population in cases where roads cannot be paved without such aid. In the city of Chicago many main roads run through hundreds of acres of farming land. Trunk-line roads come to an abrupt end when the city limits are reached, so far as a good pavement is concerned. The additional cost to county or state of pavements through large cities where state or county aid is needed is nominal in comparison with the total expenditure of money throughout the county or state for state aid roads, and the convenience of automobile owners would be greatly served by the continuous well-paved highways thereby secured. Any one who has had to make detours in order to avoid worn-out roads, unfit for use, will appreciate this. Owners of land abutting a trunk-line road in municipalities would gladly consent to have their property assessed for part of the expense of a wide pavement if state or county aid were available.

It might prove more economical in the long run if a method were provided whereby county boards could have special assessments or special taxes confirmed for the cost of a paving improvement partly to be paid for by abutting landowners, the work to be done entirely under the jurisdiction of the county authorities, with some provision for laying pavement according to grade fixed by ordinance.

Ways and means must be found to provide adequate funds to construct pavements of a permanent type. The better the type of pavement, the cheaper it is in the long run. Maintenance is more important than initial cost. If an extra inch in depth or reinforcement renders concrete pavements more durable and permanent, it is an injustice to the taxpayer to build them otherwise. Reduce the cost of maintenance, and more funds are available for road building.

Revenue laws should be amended to compel assessors to raise the valuation of property abutting state or county aid roads. Property doubled and trebled in value by reason of the construction of a state or county aid road ought to have imposed upon it a greater tax burden. In Cook County the so-called farm lands, in many townships at least, are assessed on the same basis that they were twenty-five years ago, although values have gone up as much as 1000 per cent. I have in mind a single township where state and county aid roads have been constructed, the cost of which exceeds easily a million dollars, and there has been no appreciable increase in the assessed valuation of the vast amount of acreage abutting such highways. Many years ago, in this township, the assessors hit upon a standard valuation of $100 per acre. The owners still pay on this valuation. In this township it is difficult to purchase an acre of land anywhere for less than $800, and within a quarter of a mile of any of the concrete highways land is worth an average of $1,500 an acre, some on the main highways as much as $3,000 an acre, yet it is assessed on the old basis of $100 per acre.

A certain road in this same township is on the route of a state aid road under the hundred-million-dollar bond issue. Before the bond issue was approved, property along this highway could have been purchased at prices ranging from $400 to $750 per acre. Immediately after the election at which the bond issue was approved, land jumped to an average price of $1,500 per acre. This road does not run through any important city or village, and the territory abutting it is ordinary farming country. A few days ago, 24 acres on this road at the intersection of another state aid road, neither paved as yet, sold for $2,000 per acre. These values are merely the result of anticipated construction. The taxes levied for the construction of roads built with the proceeds of Cook County bond issues are levied upon all the taxable property in Cook County. The incorporated cities and villages, including the city of Chicago, pay 95 per cent of all the taxes levied in Cook County. The city of Chicago probably contributes 90 per cent of the gross. The outlying property in unincorporated territory has increased in

One of a fleet of 857 White Trucks in the service of New York City.

New York City Buys 97 More White Trucks

THE City of New York has placed another large order for motor trucks with The White Company, bringing the total of the city's White Truck fleet up to 857, by far the largest fleet of trucks of one make in municipal service. The contract just awarded calls for 97 heavy-duty units for use by the Street Cleaning Department and follows the purchase of 20 five-ton Whites by the Borough of Queens.

The City of New York has been a user of White Trucks since 1911 and has effected big savings by motorizing its Street Cleaning and other departments.

Official records of the city show that White Trucks have always given dependable and economical service.

More than 500 cities operate upwards of 2,500 White Trucks. In routine and emergency they have become a necessary part of the machinery of municipal service.

Write for Literature on White Trucks in Municipal Service.

THE WHITE COMPANY, Cleveland

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value in greater ratio than any other class of property in the county, and yet the amount of taxes levied against thousands upon thousands of valuable acres is nominal. If valuations were honestly placed on property benefited by the construction of state aid roads, a better type of pavement could be constructed with the revenue derived from property honestly assessed, and the cost of maintenance would thereby be decreased. Moreover, the development hastened by the construction of state aid roads would not be hindered by inadequate school facilities due to the inability of rural school districts to raise the necessary funds for the proper schooling of children in territory rapidly filling with homes.

If existing road laws are modified, in the light of the experience of state and county highway officials,—who have performed so admirably, restricted as they have been,—with a view to keeping politics out of road building and allowing a wide latitude for the construction of trunk-line roads uninterruptedly between terminal points, with due regard to equitable division of expense between state, county, and property- owners where drainage is necessary and greater width and depth are required, existing problems will disappear and a new era will be opened to us.

ACKNOWLEDGMENT.—A paper presented at the Annual Convention of the American Road Builders' Association.

Why Pasadena's City Manager Resigned

THE recent resignation of C. Wellington Koiner, President of the International City Managers' Association, as city manager of Pasadena, Calif., gives emphasis to the importance, long recognized by municipal experts, of adopting the city manager plan by charter amendment rather than by ordinance.

In a three-page article in the August number of the *City Manager Magazine*, Mr. Koiner outlines the political interference with the prerogatives of the city manager which brought about his resignation. To quote in part:

"Such interference is made possible, on the part of the new board which took office in May, by reason of the fact that Pasadena's charter is not a genuine city manager charter. Under the old board, composed of men who were experienced in corporation management, the city had the equivalent of the council-manager plan in that this board delegated to the manager all of the powers that are customarily provided in the modern council-manager charter.

"Unfortunately, at the time Pasadena's charter was amended, establishing what purported to be the council-manager plan, it did not specifically set up the duties of the manager. This mistake was recognized at the time and it was planned to correct the error by again amending the charter after two years, but everything went along so well that it was not done. The incoming board felt, however, that it would like to dictate the appointments of heads of departments by not permitting the manager to make any except such as the majority of the board approved, or to maintain discipline except as they might sanction it. Changes were made in the organization ordinance accomplishing their desires and resulting in the emasculation of the manager plan so far as it applied to Pasadena, making the manager nothing more nor less than an office boy or clerk to the board. . . . .

"The council-manager plan as applied to-day, and provided for on the part of the electorate in modern charters, delegates all administrative duties to the manager. It has been found by experience that it is necessary to set up the duties of the manager by charter in such a way that tampering politicians cannot upset the plan by nullifying the authority that properly goes hand in hand with the responsibility of municipal administration. In other words, the people have learned by experience that it is easier to watch one man, in regard to administrative conduct of a city's business, than it is to assign it to five, seven, or nine men and attempt to watch them. The manager can be removed at any time by the council, but it is a difficult thing for the electorate to remove the council for mismanagement of the city's affairs until the term of the councilmen expires.

"It has also been found by experience that what is needed in economical city administration is continuity of service. The council-manager plan under a modern charter provides for this. If the manager's duties and powers can be changed at every election, then that city having such a charter had better sail under its true colors rather than attempt to propagate the idea that it has adopted the manager plan. Personally, I would rather see Pasadena revert to the mayor-council form of government than to weaken the manager plan in this way. I say this as one who thoroughly believes in the soundness of the council-manager plan as provided under the best city charters."

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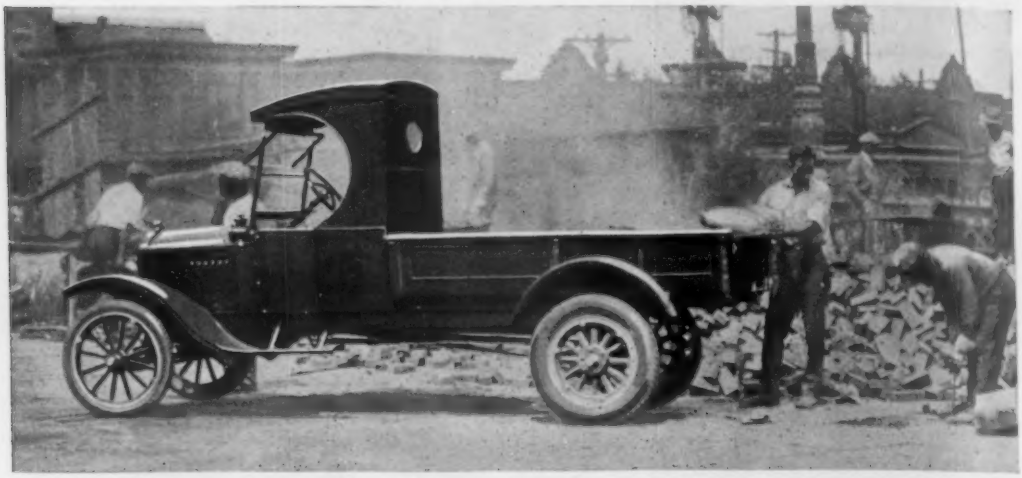

Philadelphia Uses Ford Trucks Building Broad Street Subway

Here indeed is further evidence of Ford trucking efficiency in the construction field.

The Keystone State Construction Company was selected to build the Broad Street subway in Philadelphia. This company, in turn, chose Ford trucks to transport supplies and machinery on this job. This preference for Ford equipment was based on the ready handling of these units, their speed and low operative and maintenance expense as well as small first cost.

Ford trucks serve the small contractor equally as well as the large one. Whether the hauls are short or long, Ford efficiency speeds up the job and reduces the overhead.

Your nearest Authorized Ford Dealer will gladly aid you in determining how effectively Ford trucks can serve you. He will arrange a demonstration to suit your convenience. Call him on the 'phone today.

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Proportional Representation Upheld in Cleveland

Proposed Charter Amendment Defeated

By Mayo Fesler
Director, The Citizens League of Cleveland

EARLY in May the Cuyahoga Democratic Club, composed of a group of young men of that party, announced that an amendment would be initiated proposing to strike out the proportional representation method of election from the Cleveland city manager charter and to return to the ward plurality method of election. This action followed an attack by Newton D. Baker on proportional representation at a Democratic dinner some weeks previous to that date.

The Citizens League, in an open communication, urged the Cuyahoga Democratic Club not to initiate the amendment until P. R. had been given a fair trial. The League pointed out that only one election had been held under the new method and that this had resulted in a better council than in recent years. The League also pointed out the unfairness of forcing an election in the middle of the summer.

The Cuyahoga Club group, however, persisted in its intention, secured the support of both the political organizations, utilized the office staff of the Board of Elections in circulating the petitions, and late in May filed petitions purporting to contain 34,400 signatures.

The Citizens League investigated the petitions and reported that they were filled with fraud, perjury, and invalidity. But the Board of Elections, which had not only assisted in circulating the petitions but had passed upon their sufficiency, certified to the City Council that sufficient valid signatures were attached to the petitions, and the council called the election for August 11, the date of the regular party primary.

The supporters of the charter organized a Charter Defense Committee composed of representatives of all groups and organizations and proceeded to make a vigorous campaign against the amendment. The Proportional Representation League sent an assistant secretary, George Hallet, Jr., to Cleveland with a generous contribution of funds to aid in the campaign. Two newspapers lined up with the charter defense group and two with the political party organizations.

The Citizens League prepared a report setting forth the arguments for and against P. R. and took a poll of its 5,000 members. The vote was three to one in favor of a fair and further trial of proportional representation. The newspapers carried a series of articles daily, containing arguments for and against the amendment. Councilman A. R. Hatton, author of the Charter, debated in the newspapers with Maurice Maschke, Republican leader in Ohio. Street corner meetings were held and speakers were sent out by both sides over the city to speak for and against the amendment.

On the afternoon preceding the election the Charter Defense Committee distributed 170,000 copies of a four-page newspaper entitled "A Fair Trial for P. R.—City Manager Charter." This contained the arguments for P. R., a statement of the defects of the amendment, cartoons from the daily papers, a map showing the proposed gerrymander of the city in the 33 wards, and quotations from prominent citizens.

The chief arguments advanced by the opponents of P. R., in favor of the proposed amendment, were:

(a) P. R. is a confusing and complicated method of voting.
(b) P. R. tends to develop racial and religious groups.

A Significant Decision

At a special election on August 11, the voters of Cleveland defeated an attempt to do away by charter amendment with the proportional representation method of voting in that city. In thus retaining the outstanding feature of its city manager charter, Cleveland has rendered a verdict which will doubtless give an important impetus to the spread of P. R. as a method of electing the governing bodies of American cities.

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.

(c) Fourteen wards have no representation in the City Council.

The party leaders insisted that the amendment was not aimed at the city manager features of the charter, but only at the method of election. They claimed to be unanimously in favor of retaining the city manager form of government.

would result in a minority council.

The defenders of the charter centered their attack on the fraudulent nature of the initiative petition, the defects in the proposed amendment, and the union of the two political parties in the effort to put over the amendment. The attack on political bossism and election machinery seemed to ents in the campaign.

he election on August 11 was ,918 against the amendment. f the registered voters took to the polls. The political orced the issue and were own chosen ground and on The net result of the cam- R. is better understood, the ns have betrayed their fun- ss, and the political atmos- d has been cleared. Coun- tton, who bore the brunt of the other independent coun- the race for re-election and ready on to induce a larger rade candidates to enter the cil at the fall election.

PE

-OFF

Market

quiet and prices sagged noticeably. Dullness has have

in July.

The outlook for municipal bonds is entirely favorable. The volume of borrowing by states and cities has been declining steadily since May, and it is entirely reasonable to expect a sufficient investment buying commencing about September 15 to clean up the floating supply of bonds and create an actual scarcity of attractive issues. City officials who have been delaying bond offerings during the recent inactive summer months may soon find conditions sufficiently satisfactory to invite proposals from the bond houses.

The following is a list of the most important issues of state, municipal and district bonds sold during the month of August:

		ality	Maturity	Int. Rate %	Net Yield %
	.....		1926-55	4	3.99
	N. Y.		1935-46	4¼	4.07
	Mass..		1926-55	4 & 4¼	4.08
765,000	Maryland		1928-40	4½	4.10
235,000	Delaware		1926-72	4¼	4.20
500,000	Alameda Co., Calif.		1926-28	5	4.22
[illegible]0	Rockford, Ill.		1945	4¼	4.24
[illegible]0	Baltimore, Md. ...		1933-61	4 & 5	4.30
250,000	Petersburg, Va....		1945 & 65	4½	4.45
2,000,000	Los Angeles, Calif.		1926-65	4½	4.49
1,349,500	New Orleans, La..		1927-36	4½	4.58
500,000	Halifax Co., N. C.		1940	4¾	4.62
500,000	Glendale City Sch. Dist., Calif.		1926-65	5	4.61
1,793,000	Miami, Fla.		1927-35	4½	4.73
500,000	Galveston Co., Tex.		1926-55	5	4.86
500,000	Orlando, Fla.		1926-35	5	4.93
760,000	Seminole Co., Fla.		1926-55	5¼	5.15
1,290,000	Alachua Co., Fla., Spec. Rd. & Bridge Dist. No. 1.....		1927-51	5¼	5.41
750,000	Flagler and Volusia Cos., Fla., Ocean Shore Imp. Dist.		1929-52	6	5.94
1,000,000	Roosevelt Water Conservation Dist., Ariz.		1936-55	6	7.07

Public Confidence Is the True Test of Merit

Thousands of GMC users express their faith in GMC by the surest sign—repeat orders. They know that GMC never sits back and rests in self-satisfaction every time it does a good job. GMC keeps right on working hard to do a still better job of furnishing high-grade performance with economy. These haulage buyers use GMC's continuous advance in the furthering of their own progress. Why don't you investigate GMC's performance records?

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Division of General Motors Corporation

Pontiac, Michigan

General Motors Trucks

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(c) Fourteen wards have no representation in the City Council.

The party leaders insisted that the amendment was not aimed at the city manager features of the charter, but only at the method of election. They claimed to be unanimously in favor of retaining the city manager form of government.

The chief arguments of the friends of P. R., against the amendment, were:

(a) P. R. is the simplest possible method of voting, and one which any twelve-year-old child can understand.

(b) P. R. insures majority control with minority representation.

(c) P. R. promotes tolerance and allays antagonism between racial and religious groups.

(d) P. R. has not been given a fair trial, having been used in only one election.

(e) The proposed amendment which provides for the election of 33 councilmen from unequal wards without provisions for an elimination primary, is exceptionally bad and would result in a minority council.

The defenders of the charter centered their attack on the fraudulent nature of the initiative petition, the defects in the proposed amendment, and the union of the two political parties in the effort to put over the amendment. The attack on political bossism and misuse of the election machinery seemed to be telling arguments in the campaign.

The result of the election on August 11 was 20,353 for and 20,918 against the amendment. Only one-fifth of the registered voters took the trouble to go to the polls. The political party leaders forced the issue and were whipped on their own chosen ground and on their own terms. The net result of the campaign is that P. R. is better understood, the party organizations have betrayed their fundamental weakness, and the political atmosphere in Cleveland has been cleared. Councilman A. R. Hatton, who bore the brunt of the campaign, and the other independent councilmen will be in the race for re-election and a movement is already on to induce a larger number of high-grade candidates to enter the race for the council at the fall election.

The Municipal Bond Market

By Sanders Shanks, Jr.
Editor, *The Bond Buyer*

MUNICIPALITIES which floated loans during the month of August found it necessary to pay a slightly higher rate for the accommodation than that prevailing in earlier months. In July the bond market was unusually quiet and prices sagged noticeably. Dullness has [illegible] have [illegible] in July.

The outlook for municipal bonds is entirely favorable. The volume of borrowing by states and cities has been declining steadily since May, and it is entirely reasonable to expect a sufficient investment buying commencing about September 15 to clean up the floating supply of bonds and create an actual scarcity of attractive issues. City officials who have been delaying bond offerings during the recent inactive summer months may soon find conditions sufficiently satisfactory to invite proposals from the bond houses.

The following is a list of the most important issues of state, municipal and district bonds sold during the month of August:

Amount	Municipality	Maturity	Int. Rate %	Net Yield %
$865,000	Lynn, Mass.	1926-55	4	3.99
244,000	Nassau Co., N. Y.	1935-46	4¼	4.07
300,000	Fall River, Mass..	1926-55	4 & 4¼	4.08
765,000	Maryland	1928-40	4½	4.10
235,000	Delaware	1926-72	4¼	4.20
500,000	Alameda Co., Calif.	1926-28	5	4.22
[illegible]0	Rockford, Ill.	1945	4¼	4.24
[illegible]0	Baltimore, Md. ...	1933-61	4 & 5	4.30
250,000	Petersburg, Va....	1945 & 65	4½	4.45
2,000,000	Los Angeles, Calif.	1926-65	4½	4.49
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500,000	Glendale City Sch. Dist., Calif.	1926-65	5	4.61
1,793,000	Miami, Fla.	1927-35	4½	4.73
500,000	Galveston Co., Tex.	1926-55	5	4.86
500,000	Orlando, Fla.	1926-35	5	4.93
760,000	Seminole Co., Fla.	1926-55	5¼	5.15
1,290,000	Alachua Co., Fla., Spec. Rd. & Bridge Dist. No. 1.....	1927-51	5¼	5.41
750,000	Flagler and Volusia Cos., Fla., Ocean Shore Imp. Dist.	1929-52	6	5.94
1,000,000	Roosevelt Water Conservation Dist., Ariz.	1936-55	6	7.07

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Has need of the economies insured by this equipment.

With this attachment for a Fordson and one man to operate it, the less important streets of city or town can be graded, scraped and rolled. In winter it removes snow cheaper and quicker than can be done in any other way.

For parks, playgrounds, golf grounds, allotments and in contracting and construction work, the Hadfield-Penfield "One Man" Grader will cut the time and costs of earth moving. In back filling and ditching it saves a lot.

Built of excellent material, lasts long, works faithfully.

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RIGID RAIL TRACKS

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The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

City Council's Determination of Necessity for Public Improvement Conclusive, if Reasonable

Upholding a special assessment for widening the paved portion of streets in the case of City of Carbondale vs. Reith, 147 Northeastern Reporter, 422, the Illinois Supreme Court said:

"It is suggested that the difficulty might perhaps be met by requiring vehicles to park on only one side of the street. It is possible that the difficulty might be lessened by traffic rules regulating times and places for parking, but it is apparent that the condition shown by the evidence requires some remedy. What that remedy should be was a question which the city council was called upon to determine, and the ordinance in question records its conclusion. The questions of the necessity of a local improvement, its character, where, when, and how it shall be constructed and paid for, are legislative in their nature, and have been committed by the Legislature to the determination of the city council. When that determination has been expressed in an ordinance, it is in general conclusive, but is still subject to the general rule that, where the Legislature has granted to a municipal corporation power to legislate on a particular subject without prescribing the terms of such legislation, an ordinance passed in pursuance of the power must be reasonable exercise of it or the ordinance will be pronounced invalid."

Privileged Character of Newspaper Reports of Municipal Proceedings

The law of libel and slander is so limited as to exempt certain things said, written or printed in connection with proceedings in courts, legislatures, etc.; public policy decreeing that freedom of utterance in such proceedings be not restricted through fear of being called upon to defend an action for libel or slander. In a recent case (Leininger vs. New Orleans Item Publishing Company, 101 Southern Reporter, 411) the Louisiana Supreme Court applied the principle to municipal proceedings, saying:

"A report, by a newspaper, of proceedings had at a public meeting of a municipal council, in which proceedings the public has an interest, when the report is a fair and accurate one of the proceedings had, is privileged, even though it contains matter defamatory of another. . . . Reports of such proceedings are privileged in the same manner as are reports of judicial proceedings. . . . It is not necessary in reports of judicial proceedings, and hence of the proceedings of municipal councils, 'that the report should be verbatim; nor is absolute accuracy essential so long as the report is substantially correct. A few slight accidental errors will not destroy the privilege, provided the whole report, as published, produces materially the same effect on the mind of the reader as an absolutely correct report would have done.'"

A City May Engage in Business Incidental to Public Utilities Operated by It

May a city, which owns and operates a waterworks and an electric light plant, engage in the plumbing business as an incident to such operations? This question was answered in the affirmative when lately submitted to the Kentucky Court of Appeals in the case of City of Mayfield vs. Phipps, 263 Southwestern Reporter, 37. In this case the question was somewhat narrowed by the fact that the plumbing business was to be carried on, not out of general taxes, but out of profits of the operation of the plants.

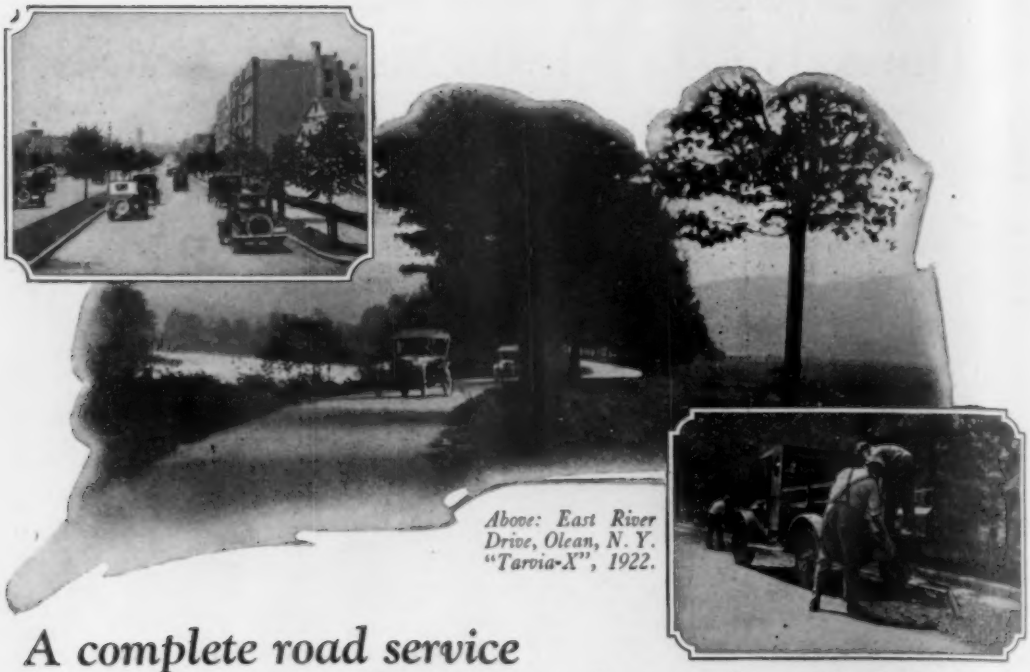
The Court finds the prevailing rule throughout the country to be that if a "business is such as to come within the regulatory power of the municipality, because of its quasi-public nature, it may be authorized by the Legislature in the absence of constitutional inhibitions to itself engage in that particular business for the benefit of the public, and when it does so it is not performing strictly a governmental function, but it is exercising what the opinions hold as its right to conduct the particular business so impressed with public purposes for the public good. . . .

Whether it is a wise or unwise policy for a municipality to carry its product from its streets into private residences, and in so doing engage in a private business, is a question with which we have nothing to do, since our task is performed when we apply the existing law to the particular question as presented by the concrete facts. Of course, we would not be understood as holding that a city, without being the owner of such public utilities, could embark in the plumbing or any other strictly private business; but in so far as that business is connected with its plant, which it lawfully owns and has the right to operate, the law seems to be clear that it has the right to perform it; but it could not either furnish material or workmen to perform the same service to an independently or privately owned plant, since its right rests solely upon its incidental power growing out of its ownership."

Sale of Sport Equipment in Parks Properly Permitted by Park Board Where Reasonably Necessary for Enjoyment of Park

Under general statutory control over parks, the Kentucky Court of Appeals holds in the recent case of Sutcliffe Company vs. City of Louisville, 266 Southwestern Reporter, 375, that commissioners may permit sale of golf equipment in a park containing golf links, especially where the grounds are considerably distant from private stores dealing in such supplies. The Court said:

"It has been held that the devotion of a reasonable portion of a public park to tennis courts, croquet grounds, baseball grounds and a golf course, with suitable appliances for these forms of public amusement and recreation, comes strictly within the proper and legitimate uses for which public parks are created. The park board may



Above: East River Drive, Olean, N. Y. "Tarvia-X", 1922.

Lower right: Road gang widening old pavement with "Tarvia K-P" mix.

Upper Left: Grand Concourse and Boulevard, New York City. "Tarvia-B" since 1911.

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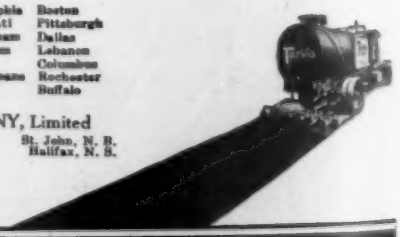

grant a privilege for a public stage route with stations and waiting-rooms in a park, where the right to run stages is confined to their operating for the sole purpose of carrying visitors into and out of the park or from one part of it to another, and it may grant a concession to hold in a public park race meets for short periods of time for the entertainment of the public, although it cannot by lease grant the use and control of a part of the park for a race track, so as to practically deprive the public of its enjoyment. In such parks it is common for the board to grant concessions where something to eat and light drinks may be sold. For some years the Cherokee Golf Club has sold balls, and 300 lockers have been maintained in which the players are allowed to keep their golf equipment. The board has, undoubtedly, authority to maintain the golf course and to do these things which are reasonably necessary for its proper enjoyment by the public."

Order Requiring Removal of Gasoline Pumps from Within Bounds of Public Highways—Upheld

Not even the Legislature can authorize a municipality to permit maintenance of permanent structures in streets for private business purposes, holds the Appellate Division of the New York Supreme Court in the case of McCoy vs. Jordan, 209 New York Supplement, 109. The opinion upholds the validity of an order requiring removal of gasoline pumps erected within the bounds of public highways in the village of Peekskill. Presiding Justice Kelly, who wrote the opinion of the Court, observed:

"There are many and increasing demands for necessaries for our private health, comfort, and happiness, food, clothing, fuel, and the like, and for other conveniences of modern life; but hitherto purveyors and purchasers have been compelled to carry on their transactions on private property. I hope I am alive to the demands of progressive civilization but I think we should not lose sight of the fundamentals: The 'king's highway' has hitherto been regarded as belonging to all the people. I hesitate to countenance further encroachments upon it for private gain. If private stations for supplying oil and fuel may be erected upon it, I do not know where we are to draw the line."

City Held to Have No Power to Furnish Water Free for Church Swimming Pool

Neither the charter nor the ordinances of the city authorized its mayor to contract with the church to furnish free water for a swimming pool operated by the latter, according to the decision of the Texas Court of Civil Appeals in the case of City of Fort Worth vs. First Baptist Church of Fort Worth, 268 Southwestern Reporter, 1016. The Court observed, in passing:

"It may be, and it will be conceded, that under the terms of the charter of the city, the city may lawfully provide swimming pools for the use and benefit of its citizens, and may contract to that end. But it cannot, under the authorities, delegate, for all time, such power to a private citizen or corporation, together with the incidental powers of regulation, fixing fees or charges, and prescribing rules of conduct for the maintenance of order and the health and safety of its citizens, etc."

And, since the contract was invalid, the Court holds that the city was not estopped to refuse further service under it because service had been furnished for some years. Nor was the city so estopped because the church had permitted the city to use its auditorium for public gatherings; such use of the auditorium not forming any part of the legal consideration for furnishing the water service.

City May Make Reasonable Regulations for Safety of Railroad Crossings

Charter or statutory power in a city to provide for the general welfare authorizes reasonable regulation of street crossings over railroad tracks, according to the decision reached by the Georgia Supreme Court in the case of City of Acworth vs. Western & Atlantic Railroad Company, 126 Southeastern Reporter, 454. But it was decided that it was unreasonable and unconstitutional for the city in this case to attempt to require the railroad company to substitute watchmen at crossings for automatic warning devices. The Court said:

"If the public safety requires the employment of watchmen at these crossings, the fact that the execution of the plan would involve expenditure so heavy as to impair the efficiency of the railroad as an agency of interstate commerce, or even cripple the company financially, would not render these ordinances violative of the . . . Federal Constitution. . . . But . . . there was abundant evidence to justify the judge in finding and holding that the installation and operation of the signaling device known as a wigwag at these crossings dispensed with the necessity of keeping watchmen there."

Municipality in Ohio Held to Have No Power to Create Courts and Appoint Judges

Under the constitution of Ohio the municipalities of that state have no power to create courts and appoint judges thereof, held the Supreme Court of the state in the recent case of State vs. Hutsinpiller, 147 Northeastern Reporter, 647. The Court said:

"After all, no power of local self-government in the municipality is interfered with by this denial of the power to create courts. All the executive, legislative, proprietary, and general governmental powers incident to municipal government may still be exercised, and legal rights, arising under state law and municipal ordinance, be measured by local judges sitting in courts created under constitutional sanction, applicable alike to all municipalities of the state. The power of local self-government under such a court can be as well exercised as under a court created by local charter. It is the law that is to be construed and interpreted, and it is the same in any court, but the court itself can only be created by the power authorized by the Constitution."

Ordinance Requiring Sewer Connection Upheld

That it will involve considerable expense for a property owner to make connection with city sewers does not render him immune from the provision of an ordinance requiring such connection, held the South Carolina Supreme Court in the case of City of Columbia vs. Shaw, 127 Southeastern Reporter, 722.

Snows as Deep Now as They Were in '80s
New York Times Leased Wire.
WASHINGTON, D. C.—The United States weather bureau on Monday punctured a popular fallacy usually expressed by elderly people in "we don't have such heavy snowfalls now as we did when I was a child." According to the weather bureau the winters nowadays are just as severe as they were in the days of our grandadds.
"As a matter of fact," said the weather bureau, "the deep snow remembered by the man who was a boy in the seventies or eighties reached that boy's shoulders, but would be less than knee deep with his present stature. Again many men who now live in cities were brought up in the country where large drifts are piled up where the wind has full sweep over
NEW LOADER USED BY DULUTH IN FIGHTING SNOW
Street Railway Company Keeps Tracks Clear; Cars on Time.
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A snow covered street with a single plowed lane along its center is certainly a single track affair. Traffic can't move along it with any degree of speed. Tie-ups are frequent. Half the street is wasted.

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You can widen that lane by hiring a gang of hand laborers to shovel the snow into trucks or wagons. But shovelers are slow and they cost a lot of money.

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And in the summer, the Barber-Greene can be converted into an efficient bucket loader. That makes it a year-'round saving and earning proposition. A goodly portion of the money that was formerly spent on snow shovelers can be devoted to the building of new streets—a tangible town improvement and then as a converted bucket loader, the Barber-Greene will help.

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Zoning Notes

Prepared by Frank B. Williams
Author of "The Law of City Planning and Zoning"
From data collected by the Zoning Committee of New York (233 Broadway)
Mr. Williams may be addressed in care of THE AMERICAN CITY, 443 Fourth Avenue, New York

Recent Zoning Ordinances and Enabling Acts

FLORIDA.—Act, approved June 2, 1925, following model act of Department of Commerce, Washington, D. C., enabling municipalities in the county of Pinellas to adopt zoning regulations.

IDAHO.—Enabling act, cities of the first class, 1925, ch. 174.

INDIANA.—Act, in effect April 25, 1925, amending enabling act 1921, ch. 225.

KANSAS.—Act, 1925, ch. 100, amending enabling act, now Rev. Stats. 1923, sec. 13-1101.

RHODE ISLAND.—Act, 1925, ch. 746, amending enabling acts, 1922, ch. 2299, and 1923, ch. 538, for Westerly.

SOUTH DAKOTA.—Act, March 10, 1925, authorizing owners of real property in cities to enter into zoning covenants.

ROANOKE, VA.—Zoning provisions in Building Code.

Recent Zoning Decisions

CONNECTICUT.—The *Christian Science Monitor* for August 1, 1925, reports a decision of the Superior Court of Connecticut, in the case of the City of Hartford v. Butler and Katz, sustaining the constitutionality of the state zoning enabling act and the Hartford zoning ordinance. A number of interesting legal points seem to have been involved in the case, but cannot profitably be discussed without the text of the decision, which is not at this time available.

NEW YORK.—*Application of Wulfson v. Burden, Inspector of Buildings of Mount Vernon, Appellate Division, Second Department.* Application for mandamus to permit the erection of an apartment house partly in a residential district and partly in a business district, contrary to the provisions of the zoning ordinance in this respect, and also in that it did not set back from lot lines as required of such a house in these districts. In the August "Zoning Notes" the decision in the Supreme Court granting the application on the ground that the zoning ordinance was invalid in these respects was given. In the Appellate Division, by a unanimous decision the Court sustains the zoning ordinance and refuses the application, thus reversing the decision below. The upper court decides the point "as a matter of law and not in the exercise of discretion."

This decision by a unanimous court probably establishes in this state the validity under a proper ordinance of suitable provisions establishing residential districts from which apartments are excluded. A similar decision (Application of Headley v. Fennell) in the Supreme Court, sustained by the Appellate Division, will be found in our August "Zoning Notes."

People v. Stanton (County Court, Nassau County), 125 *Misc.* 215. An ordinance of the village of Malverne provided that automobiles when stored outside a garage must be kept at least 60 feet from the street and screened from view. Defendant, who had maintained a garage in the village for several years before the ordinance was passed was convicted of violating it. Held that, as no question of public health, morals, comfort, or safety was involved, and defendant has acquired a vested right in his business as located, the ordinance as to him was invalid, and the conviction must be reversed.

NORTH DAKOTA.—*City of Bismarck v. Hughes, District Court, Fourth District,* June 13, 1925. Provisions creating a residential district from which apartment houses are excluded, are constitutional.

OHIO.—*City of Youngstown, et al. v. Kahn Brothers Building Co., Court of Appeals, Mahoning County,* May 19, 1925. A provision in an ordinance establishing a fraction only of the territory of a municipality into a district, and providing that no building which is intended to be used as a dwelling shall be erected within the district except as a single- or two-family dwelling, in a case where the record shows that the district is a most healthful part of the municipality in which to erect an apartment house and that the public health, morals, and safety of the district and of the entire municipality will not be impaired by the erection of such an apartment house, constitutes a taking of property without due process of law and a taking of private property for public use without compensation, and is invalid.

Pritz v. Messer, Court of Appeals, Hamilton County, May 19, 1925.

An ordinance enacted by a municipality under proper enabling legislation, dividing the whole territory of the municipality into districts according to a comprehensive plan which, in the interest of the public health, public safety, and public morals, regulates the uses and the location of buildings and other structures and of premises to be used for trade, industry, residence, or other specific uses, the height, bulk, or location of buildings and other structures thereafter to be erected or altered, including the percentage of lot occupancy, setback building lines, and the area of yards, courts and other spaces, and for such purposes divides the city into zones or districts of such number, shape, and area as are suited to carry out such purposes, and provides a method of administration therefor and prescribes penalties for the violation of such provisions, is a valid and constitutional enactment.

PENNSYLVANIA.—*Appeal of White from Board of Appeals of Pittsburgh, Superior Court, Western District,* July 9, 1925. Section 32 of the zoning ordinance provides: *"First area district.*—In this district the minimum dimensions of yards and other open spaces, and the area of lot required per family housed thereon, shall be as follows: Front

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yard: (a) There shall be a front yard having a depth of not less than 15 feet.

"(b) When the front wall of 80 per cent of all the buildings on one side of a street between two intersecting streets have been kept back from the street line, no building hereafter erected or altered shall be placed nearer to the street line than the distance established by the majority of the 80 per cent at the time of the passage of this ordinance." * * *

"The house is on Evaline Street between Harriet Street and Friendship Avenue; in the same square and fronting on the same side of the street, are 20 houses (15 single and 7 double houses); an additional house in the square fronts on Friendship Avenue and this house is built 2.2 feet from the street line of Evaline Street; 4 houses are built back from 22 to 25 feet; the others are built back about 40 feet. All except the corner house fronting on Friendship Avenue have open front porches varying in width from about 7 to 10 feet, extending toward the street that distance. * * *

"The ordinance purports to zone the entire city, built-up as well as unbuilt. Section 32 (b) establishes a building line on streets wholly or partially built-up. Consideration of the section will disclose that the line may be further back from the street line on one side of the street than on the other, and even on the same side of the street its distance from the street line may vary in different squares, its location depending wholly on how far back (if at all) a house or houses had already been built, and if but one house had been built, its line would seem to control all the other lot owners. If no house has been built, 32 (a) would seem to require all builders to recede at least 15 feet. * * *

"In view of the haphazard results of the arbitrary municipal action expressed in the ordinance, it is helpful to consider what was said by the Supreme Court of a situation having essential elements in common with this (in *Eubank v. Richmond*, 226 U. S. 137) where the police power was also put forward to justify an ordinance requiring the authorities to establish building lines on separate squares, not less than 5 nor more than 30 feet back of public streets and across private property at the request of the owners of two-thirds of the property abutting on a street. The Court said: 'It leaves no discretion in the committee on streets as to whether the street line shall or shall not be established in a given case. The action of the committee is determined by two-thirds of the property owners. In other words, part of the property owners fronting on the block determine the extent of use that other owners shall make of their lots, and against the restriction they are impotent. * * * In what way is the public safety, convenience, or welfare served by conferring such power? The statute and ordinance, while conferring the power on some property holders to virtually control and dispose of the proper rights of others, creates no standard by which the power thus given is to be exercised; in other words, the property holders who desire and have the authority to establish the line may do so solely for their own interest or even capriciously. Taste (for even so arbitrary a thing as taste may control) or judgment may vary in localities, indeed in the same locality. There may be one taste or judgment of comfort or convenience on one side of a street and a different one on the other. There may be diversity in other blocks; and viewing them in succession, their building lines may be continuous or staggering (to adopt a word of the mechanical arts) as the interests of certain of the property owners may prompt against the interest of others. The only discretion, we have seen, which exists in the street committee, or in the committee of public safety, is in the location of the line between 5 and 30 feet. It is hard to understand how public comfort or convenience, much less public health, can be promoted by a line which may be so variously disposed.' 226 U. S. 143.

"Section 32 (b) cannot be sustained as a lawful exercise of the police power in the circumstances disclosed in this record."

The judgment of the court below, a summary of which will be found in our "Zoning Notes" for August, 1924, was reversed.

Recent Zoning Literature

Our readers will remember that the zoning regulation of Boston, Mass., was enacted as a state statute. That statute, on June 5, 1925, had been in operation one year, and Miss Elizabeth M. Herlihy, Secretary of the City Planning Board, and Clerk of the Board of Zoning Adjustment of Boston, in honor of its birthday, has written an article descriptive of its operation and effect during the year. The article will be found in the *Boston Real Estate Exchange Bulletin* for July, 1925.

"Zoning for Iowa Cities and Towns" is the title of Bulletin No. 52 of the Iowa State College of Agriculture and Mechanic Arts. The Bulletin is by Rolland S. Wallis, and is dated June 10, 1925.

Zoning in New York City.—The Report of the Chief Engineer of the Board of Estimate and Apportionment of the City of New York for 1923 has just appeared. It contains, on pages 38, 96, and 112, a detailed account of official action with regard to zoning in the city during the year.

Home Rule and Zoning in New York

For technical reasons connected with the method of its passage, the Appellate Division, by a unanimous court, has declared the home rule constitutional amendment, and the local laws passed under it, to be invalid. The case reaching this conclusion (*Schieffelin v. Mills, Commissioner of Plant and Structures of New York City*, reported in *New York Law Journal* July 9, 1925) will undoubtedly be carried to the highest court of the state. Just how much zoning power cities possessed under home rule in New York had not been as yet determined, but several cities had passed local zoning laws. The fate of the case in the upper court is awaited with great interest.

26,000,000 PEOPLE LIVE IN ZONED CITIES, TOWNS AND VILLAGES

According to statistics just released by the Division of Building and Housing of the Department of Commerce, there has been an increase of more than 130 per cent in the number of people living in zoned cities and towns in the United States during the past four years. On July 1 of this year more than 26,000,000 people were living in 366 zoned municipalities, as against the less than 11,000,000 people in 48 cities and towns in September, 1921. The number of zoned municipalities has thus increased more than seven times during the four-year period.

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Municipal and Civic Publications

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Effective Regulation of Public Utilities.—By John Bauer, Ph. D., Public Utility Consultant, New York City; formerly Lecturer on Regulation, Accounting and Finance at Cornell, Princeton and Columbia Universities. The Macmillan Company, New York. 1925. VIII + 381 pp. $2.50.

This book is written with the purpose of doing away with indefiniteness and futility in the field of regulation, which has been largely concerned with rate-making and has given less attention to promoting service and economy of operation. The difficulties of the task are shown, and the author presents a plan for making the process of rate-making definite and practically automatic. Action under adequate legislative authority is the means advocated, with the courts determining the constitutionality of the legislative action. Automatic rate control would involve an appraisal of existing properties used in the public service, to determine once for all reasonable and definite sums entitled to future return, and after such valuation, the taking of the results in each case upon the books of the company, all additional investments being added to the initial valuation. This volume is not only a college and university text-book, but a work of value to commissions, investors, utilities, and all others concerned in the work of regulation.

Public vs. Private Ownership of Public Utilities.—An address by Arthur Williams, Vice-President—Commercial Relations, New York Edison Company, delivered June 27, at Camp Taminent, near Bushkill, Pa., during a conference conducted by the League for Industrial Democracy. The author's aim in this discussion is to aid in correcting long-standing misconceptions upon the issues involved in the rival claims of public and private control of the sources of producton, and to show that privately owned and operated public utilities are meeting their economic and social obligations to a degree not generally understood, and are also showing their sense of responsibility to the public. 22 pp. (Apply to author, 130 East 15th Street, New York, N. Y.)

An Analysis of Transit Policy, New York City.—A report of a study made by The Merchants Association of New York of the plans proposed by Mayor Hylan and the City Board of Transportation for the construction of new subway routes. July, 1925. 36 pp. "Maximum capacity for service the most important consideration—It can be secured only by consolidation of transit facilities." (Apply to the Association, Woolworth Building, New York, N. Y.)

"Itinerant Vendors."—What to Do and What Not to Do With Reference to Their Control.—A paper delivered before the 1925 annual meeting of the New England Commercial Secretaries Association, by E. G. Kingsbury, Secretary of the Chamber of Commerce, Stamford, Conn. 7 mimeographed pp. It is maintained that the canvasser cannot be legislated out of existence, but can be educated out, if local merchants will band together to teach the public that they—the permanent dealers—stand back of the reliability of their goods, that prices are right, and that unsatisfactory goods can be returned. (Apply to the author.)

The Nation's Health.—With the August 15th issue of this publication, Dr. C.-E. A. Winslow, Professor of Public Health, Yale School of Medicine, retires as editor and is succeeded by Dr. Frank L. Rector, former Secretary of the Conference Board of Physicians in Industry, and medical investigator for the National Industrial Conference Board, New York. Dr. Rector will be in the Chicago office, and all of his time will be devoted to the work. Dr. Winslow will continue his active interest in the work as a member of the consultant editorial board which is being formed. Mrs. Susa P. Moore has been named managing editor. These changes have been made to overcome the difficulties of functioning with the editorial and the publication offices in widely separated places.

Health Books.—A valuable list of books on health for sale by the American Public Health Association, 370 Seventh Ave., New York, N. Y. The Association furnishes promptly expert opinion about any books on public health service.

City Planning and Automobile Traffic Problems.—By Alvan Macauley, President, Packard Motor Car Company, Detroit, Mich. Reprinted from "Automotive Industries and Public Works." 45 pp. The data on which the articles are based were collected in order to obtain a clearer basis of fact with regard to traffic problems. The articles were written to interpret the facts and to bring together the view-points of the automobile industry and of the city planner. The article entitled "Traffic Problems—Basic Facts and Suggested Remedies" contains in tables and comment an analysis and summary of replies to a questionnaire prepared by the Packard Motor Car Company in cooperation with "Public Works," June, 1924. (Apply to the Company.)

Laws Relating to Sex Offenses Against Children.—By Reuben Oppenheimer, and Lulu L. Eckman. Children's Bureau Publication No. 145. 74 pp. 10 cents. (Apply to Government Printing Office, Washington, D. C.)

Tourist Camps.—By Rolland S. Wallis. Bulletin 56, revised, of the Engineering Extension Department, Iowa State College, Ames, Iowa. July 8, 1925. 63 pp. Illustrated. The purpose of this publication is to assist communities to equip camping grounds and to improve on what they already have. The suggestions are based on the results of an extended investigation, and represent the ideas of many experienced individuals. (Apply to the Department.)

Zoning for Iowa Cities and Towns.—By Rolland S. Wallis. Bulletin 52 (third edition) of the Engineering Extension Department, Iowa State College, Ames, Iowa. June 10, 1925. 19 pp. Explaining what zoning is, what it requires and involves, and what benefits it brings. (Apply to the Department.)

City-Planning Procedure for Iowa Municipalities.—By Rolland S. Wallis. Bulletin 74 of the Engineering Extension Department, Iowa State College, Ames, Iowa. June 24, 1925. 19 pp. Every city and town in Iowa now has the power to create and to maintain an official city-plan commission. (Apply to the Department.)

Free Public Bath Commission, Baltimore, Md.—A historical sketch of the Commission, published to mark the twenty-fifth anniversary of the indoor shower-baths of the city. 1925. 30 pp. Illustrated. (Apply to the Commission.)

The Case for P. R.—Selections from a forthcoming book by the Secretaries of the Proportional Representation League, 1417 Locust Street, Philadelphia, Pa. The July, 1925, issue of the "Proportional Representation Review." Intended to be of use for workers in P. R. charter campaigns. 32 pp. 20 cents. Apply to the League.)

National Conference on Outdoor Recreation.—Organization and Program, 1924-1925. July, 1925. 36 pp. Illustrated. The function of the Conference is to assist in the working out of a national policy which will coordinate the activities of federal, state, county, municipal, and unofficial agencies for outdoor recreation and to promote the development of the recreational resources of the country and stimulate their use. (Apply to the Executive Secretary, Room 2032, New Navy Building, Washington, D. C.)

Notes on the Clarification of Colored Waters.—By Lewis B. Miller, Chemist, Hygienic Laboratory, United States Public Health Service. 10 pp. in Public Health Reports for July 10, 1925. (Apply to United States Public Health Service, Washington, D. C.)

Public Art in St. Louis—Sculpture, Architecture, Mural Decorations, Stained Glass.—By Mary Powell, Supervisor of Education, City Art Museum; formerly Chief of the Art Department, St. Louis Public Library. The St. Louis Public Library Monthly Bulletin, July-August, 1925. Second edition, revised. 56 pp. Charming drawings. The notes are merely descriptive, not critical. The arrangement is alphabetical, as being practical for school children and sight-seeing visitors. 25 cents. (Apply to the Library.)

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High Street, Akron, Ohio—one of the heaviest-traveled streets in the city—was resurfaced with Trinidad Lake Asphalt over old brick in 1921. *Not a cent has been spent on maintenance to date.*

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An Introduction to Public School Finance.—By Benjamin Floyd Pittenger, School of Education, University of Texas. Houghton Mifflin Company, Boston. 1925. XVI+372 pp. $2.00 postpaid.

This is one of the Riverside Textbooks in Education, edited by Ellwood P. Cubberley, Dean of the School of Education, Leland Stanford Junior University. The author has summarized the most valuable discussions of this increasingly important subject in such a way as to make its literature available to students and to school officers. Both sides of controversial points are presented in describing present theory and practice. The local problem and the state problem form the divisions of the volume.

The Quality Problem in Relation to Chicago's Water Supply.—Official report to Col. A. A. Sprague, Commissioner of Public Works, by John Ericson, City Engineer. May, 1925. 29 pp. besides inserted plans. A review of the situation in regard to a pure water-supply for Chicago, presenting plans, with description, of a typical filter plant, with proposals for experimental work that it is hoped will ultimately insure the best layout and most efficient methods of purifying a raw water-supply for Chicago. (Apply to the City Engineer.)

The Water Supply Problem in Relation to the Future Chicago.—By John Ericson, City Engineer, Chicago. Extract from a paper read at the Midwinter Convocation of the Western Society of Engineers, February 19, 1925. 25 pp. Charts, tables. Reviewing the present and probable future needs for water service in Chicago, and showing the necessity of eliminating preventable leakage and waste of water by introducing a universal metering system. (Apply to the City Engineer.)

Flammable Liquids.—Two pamphlets, published by the National Fire Protection Association, 40 Central Street, Boston, Mass., 1925. Advance publication of the report of the Committee on Laws and Ordinances, giving proposed revision of the suggested ordinance regulating the use, handling, storage and sale of flammable liquids and the products thereof; also of the report of the Committee on Flammable Liquids, dealing with oil-burning equipments, containers for flammable liquids, and dry-cleaning plants. 20 and 16 pp. respectively. (Apply to the Association.)

A Report Upon the Operation of the Municipal Markets of the City of Cleveland.—Prepared by the Municipal Research Bureau of Cleveland, July, 1924. 44 quarto typewritten pp. An examination of facts to determine whether the citizens are receiving definite benefits which justify the propriety of this municipal function. Recommending financial adjustments to make the markets self-supporting on a basis of sound municipal accounting; recommending also advantageous physical changes. (Apply to the Bureau, 403 Electric Building, Cleveland, Ohio.)

Town Planning in Melbourne, Australia.—First Report of the Metropolitan Town Planning Commission, Melbourne. March, 1925. An elaborate interim report of 68 pp. with 24 plates, besides 8 maps, dealing with the necessity for making some immediate provision for the relief of traffic congestion. Each recommendation made will, when carried out, give immediate advantages, and, without modification, will form part of the ultimate proposals of the Commission for metropolitan development and improvement. (Apply to the Commission.)

The Police Department, City of New York.—A Brief Review of its Organization and Some of its Activities. 1925. 23 pp. Photographs, charts. (Apply to the Department.)

Traffic Code of the City of Dayton, Ohio.—Including limited parking ordinances. 1925 edition. Pocket size. 64 pp. Illustrated. Persons arrested for fast driving and other violations of the traffic ordinances may be imprisoned from one to five days for first offenses. (Apply to E. L. Pletcher, Clerk of the City Commission.)

Social Hygiene and Public Health.—By Lee K. Frankel, Ph. D., Second Vice-President, Metropolitan Life Insurance Company. An address before the National Social Hygiene Conference, in Cincinnati, Ohio, November 21, 1924. 5 pp. (Apply to American Social Hygiene Association, Inc., 370 Seventh Avenue, New York, N. Y.)

Sewage Treatment, Syracuse, N. Y.—General Description of the Sewage Treatment Works and Other Improvements Constructed by the Syracuse Intercepting Sewer Board, Syracuse, N. Y. 1925. 24 pp. Illustrated. Not a technical report, but a description of some of the more interesting features of the work and a discussion of some of the perplexing problems dealt with by the Board and its engineers. (Apply to Glenn D. Holmes, Chief Engineer of the Board.)

Taxation and Welfare.—By Harvey Whitefield Peck, Associate Professor of Economics in the University of Vermont. The Macmillan Company, New York. 1925. VII+269 pp. $2.50.

The first part of this volume deals with the scope of public expenditure; the second with the problem of the distribution of the tax burden. The author considers how far taxation is justified in the necessary and desirable functions of the state, and develops a theory as to what portion of income is due the state and can be wisely taken by the state in behalf of social progress without diminishing individual energy.

Taxation for State Purposes in Pennsylvania.—With notes on tax laws in other states. By Leonard P. Fox, Ph. D., Manager Research Bureau, Pennsylvania State Chamber of Commerce, Harrisburg, Pa. 1925. 155 pp. Detailed information under the following chapter heads: The High Cost of Government; Separation of Sources of State and Local Revenues; Development of State Tax System; Summary of State Tax Laws; General Corporation Taxes; The Manufacturers' Tax; Taxation of Public Utilities; Taxation of Banks; Mercantile License Tax; Gasoline Tax and Motor Fees; Anthracite Coal Tax; State Inheritance Tax; State Income Tax; Miscellaneous Taxes and Notes. (Apply to the Research Bureau.)

County Health Work.—Cooperative County Health; Demonstration in Efficient and Economical County Health Service; Directory of Whole-Time County Health Officers, 1925. In the May 15, 1925, issue of Public Health Reports, issued by the United States Public Health Service. 20 pp. (Apply to Government Printing Office, Washington, D. C.)

A City Plan for Worcester, Mass.—Submitted by the Planning Board to the Mayor and City Council as Their Annual Report for the Year Ending November 30, 1924. 173 quarto pp. Embodying all the recommendations of the Board in regard to every phase of the complete city plan, and including all the data, studies, maps and charts prepared for the Board by the Technical Advisory Corporation, 15 Park Row, New York City, consulting engineers. Presenting a program of work which should extend over a period of at least 50 years. (Apply to the Technical Advisory Corporation.)

Out of the Smoke Zone into the Ozone.—The story of the development of the city plan features of Woodmar, Ind., its golf club, its mile and a half of 275-foot boulevards, and the Wicker Park project. 16 quarto pp., with map inserts. Views, plans, drawings. Woodmar is a 640-acre restricted townsite, planned by Jacob L. Crane, Jr. (Apply to Securities Realty Company, Hohman and Ogden Streets, Hammond, Ind.)

Building Codes.—Two pamphlets. Recommended Minimum Requirements for Masonry Wall Construction; June 26, 1924; 57 pp.; 15 cents. Minimum Live Loads Allowable for Use in Design of Buildings; November 1, 1924; 38 pp.; 10 cents. Reports of the Building Code Committee of the Department of Commerce. (Apply to Government Printing Office, Washington, D. C.)

The Administrative Control of Contagious Diseases.—By C. V. Craster, M. D., Fellow, A. P. H. A., Health Officer, Newark, N. J. A paper read at the joint session of the Public Health Administration and Public Health Nursing Sections of the American Public Health Association at the fifty-third annual meeting, at Detroit, Mich., October 22, 1924. Reprinted from the May, 1925, issue of the *American Journal of Public Health*. 8 pp. "Disease is not, however, inevitable, for all the signs point to increasing aid from natural and acquired immunity in human beings to all known infections." (Apply to American Journal of Public Health, 370 Seventh Avenue, New York, N. Y.)

Planning of Unbuilt Areas.—A form of state enabling act, with annotations, prepared by Edward M. Bassett. Providing for the establishment of an official map or plan at the option of every municipality, the approval of plats, the protection of mapped streets, the setting aside of small parks for playgrounds, the modification of zoning in platted areas, and the control of building permits. 1925. 11 pp. (Apply to Regional Plan of New York and Its Environs, 130 East 22nd Street, New York, N. Y.)

Relation of the Executive to the Board of Directors.—By Sherrard Ewing. A manual of the American City Bureau, reprinted by permission. Pamphlet No. 6 of the National Association of Travelers Aid Societies, 25 West 43rd Street, New York, N. Y. 16 pp. Emphasizing the elements that give force and direction to the secretary's relation to the board of directors, indicating the wide scope of this service, and defining the limitations which the secretary must not overstep if his usefulness is to continue. (Apply to the Association.)

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Municipal Bond Sales for the Year 1924.—Published by "The Bond Buyer," 67 Pearl Street, New York, N. Y. 119 quarto pp. $10.00.

A record of the domestic and foreign government, state, and municipal bond sales in the United States during the year, compiled from official and reliable reports made to the publishers. The record covers some 7,700 issues of bonds, and aggregates more than $2,000,000,000.

Public Health in Theory and Practice.—By William Henry Welch, M.D., LL.D., Director of the School of Hygiene and Public Health, Johns Hopkins University. Yale University Press, New Haven, Conn. 1925. 51 pp. $1.00

An historical review, the second annual Sedgwick Memorial lecture, delivered at the Massachusetts Institute of Technology, January 25, 1924. It shows the changing conceptions of disease as related to preventive medicine and of the resulting theories and practices of public health at different periods of history, and draws the lesson that success in the control of disease is directly dependent on accurate knowledge of the causation and propagation of disease.

A Census Analysis of American Villages.—By C. Luther Fry. Published by the Institute of Social and Religious Research, New York. 1925. XVI + 165 pp. Tables, charts, maps. $2.50.

A study of the 1920 census data for 177 villages scattered over the United States, which gives a survey of the economic and social conditions of villages in farming areas. Such a study is of importance to those interested in municipal matters, because of the city-ward migration of rural populations, and the relationships between town and country.

Simplified School Accounting.—By Arthur J. Peel, Consulting Accountant, Boston, Mass. The Bruce Publishing Company, Milwaukee, Wis. 118 pp. Illustrated. $1.35.

A reprint of a series of articles that appeared in "The American School Board Journal," giving a popular description and discussion of financial accounting principles and practice for the average-sized city school districts, and also suggestions and methods for scientific bookkeeping and a system of serviceable records.

School Lighting.—Two pamphlets. School Lighting as a Factor in Saving Sight; Eye Sight Conservation Bulletin 6, published by permission by the Eye Sight Conservation Council of America, Times Building, New York, N. Y.; 19 pp., illustrated; 10 cents. Lighting the Schoolroom; published by permission by the National Committee for the Prevention of Blindness, 130 East 22nd Street, New York, N. Y.; 4 pp. Both based upon the American Standard Code of Lighting School Buildings prepared and issued under the joint sponsorship of the Illuminating Engineering Society and the American Institute of Architects and approved by the American Engineering Standards Committee. (Apply to the publishers of each.)

Zoning for Health.—A paper read at the fifth annual conference of the Town Planning Institute of Canada, at Ottawa, Ont., May 15, 1925, by B. Evan Parry. Published in the June, 1925, issue of the *Journal* of the Institute. A strong argument for zoning on the basis of its providing an economic, scientific, healthful, and efficient community program of city building. (Apply to the Secretary of the Institute, John M. Kitchen, City Hall, Ottawa, Ont.)

A Typhoid Fever Epidemic Caused by Oyster-borne Infection (1924-25).—By L. L. Lumsden, Surgeon, H. E. Hasseltine, Surgeon, J. P. Leake, Surgeon, and M. V. Veldee, Assistant Surgeon, U. S. Public Health Service. Supplement No. 50 to the Public Health Reports published by the U. S. Public Health Service. 102 pp. Maps, charts, tables. An account of the investigation that proved that shell oysters distributed by a certain producing company were mainly responsible for the spread of typhoid fever infection in New York, Chicago, Washington, D. C., and several other cities between October 25 and December 20, 1924. 20 cents. (Apply to Government Printing Office, Washington, D. C.)

The Minneapolis City Charter. 1856-1925.—By Jessie McMillan Marcley, M. A. Publications, No. 5, of the Bureau for Research in Government of the University of Minnesota, Minneapolis, Minn. June, 1925. IX+133 pp. Insert of organization chart of the city government, 1921. An enlivening history of the development of municipal government in Minneapolis, derived from original sources. Chapter X is on The Proposed Council-Manager Charter. The charter is to be voted upon this fall; hence, this chapter will be of special interest to our readers. (Apply to the Bureau.)

A Proposal to Control Billboards.—Specially Devised for Pennsylvania but Applicable to Other States.—By J. Horace McFarland, L. H. D. A 2-page reprint from the *National Municipal Review*, June, 1925. An explanation of the principle involved in the Buckman Bill, introduced in the Pennsylvania Legislature of 1925, to place under the control of the Secretary of Highways all advertising signs visible from the state highways, authorising him to exercise the police power of the state to eliminate those signs that divert the attention of drivers of vehicles and thus increase traffic dangers. (Apply to American Civic Association, Union Trust Building, Washington, D. C.)

Footprints.—Report of Fifth Year's Work of State Department of Public Welfare, Georgia. June 1, 1925. 49 pp. 2 drawings. A strong protest against the inhumanity and wastefulness of the old system of dealing with the socially handicapped, and a most interesting account of the more intelligent work that has been begun in Georgia. (Apply to Rhoda Kaufman, Secretary, State Department of Public Welfare, State Capitol, Atlanta, Ga.)

Recommended Specification for Quicklime and Hydrated Lime for Use in the Purification of Water.—4 pp. Based on a draft originally prepared by W. D. Collins, of the Quality of Water Division of the Geological Survey of the Interior Department, and approved unanimously by an Interdepartmental Conference on Chemical Lime, called together by the U. S. Bureau of Standards and composed of representatives of the Geological Survey, Bureau of Mines, Bureau of Soils, Bureau of Chemistry Forest Service, Fixed Nitrogen Laboratory, and Chemical Warfare Service. 5 cents. (Apply to Government Printing Office, Washington, D. C.)

Civil Service Board, Oakland, Calif.—Two pamphlets, both issued June 1, 1925. Civil Service Rules on Classification and Examination Subjects and Weights; Compensation Schedule; 96 + VII pp. Civil Service Rules and Charter Provisions; also Salary and Wage Schedule of All Positions in the Municipal Service of Oakland; 52 + VII pp. (Apply to the Board.)

Public Welfare and the Community as It Relates to the North Carolina Plan of Public Welfare.—A Statement for the North Carolina Federation of Women's Clubs. Issued by the Bureau of Public Discussion, University Extension Division, University of North Carolina, Chapel Hill, N. C. 53 pp. Free for distribution only in North Carolina; 50 cents to residents of other states. (Apply to the Bureau.)

Public Aid of Children.—Three pamphlets issued by the Child Welfare Committee of America, Inc. The Care of Dependent Children, an address by Hon. James J. Davis, Secretary of Labor for the United States, delivered at the Child Welfare Conference in New York on May 15, 1925; 8 pp.; advocating maintaining the unit of the family. Some Striking Inequalities in Laws Relating to Public Aid to Children in Their Own Homes, by Lulu L. Eckman, Children's Bureau, U. S. Department of Labor, an address delivered at the Conference, on May 18, 1925; 19 pp.; with a summary of "What Needs to Be Done to Reach Every Needy Child." Orphan Asylums Seen as Passing, by Sophie Irene Loeb, President, Child Welfare Committee of America; reprint of an article from the *New York Evening World*, June 6, 1925; 7 pp. (Apply to Child Welfare Committee of America, Inc., 730 Fifth Avenue, New York, N. Y.)

Method for Early Detection of Epidemic Trends.—By Herman N. Bundesen, M. D., Fellow A. P. H. A., Commissioner of Health, and Arthur W. Hedrich, Fellow A. P. H. A., Director of Surveys, Department of Health, Chicago, Ill. Reprinted from the "American Journal of Public Health" for April, 1925. A paper presented at the Joint Session of the Public Health Administration and Vital Statistics Sections, American Public Health Association, at Detroit, Mich., October 20, 1924. 8 pp. Charts, table. (Apply to the "Journal," 370 Seventh Avenue, New York, N. Y.)

The Industrial Survey.—An Economic Appraisal of the City or District. Specially written to describe the type of industrial survey made by the Technical Advisory Corporation, consulting engineers, 15 Park Row, New York, N. Y. July, 1925. 7 pp. (Apply to the Corporation.)

Year Book of the State of Indiana, for the Year 1924.—Compiled and published under the direction of Emmett F. Branch, Governor, by the Legislative Reference Bureau; Charles Kettleborough, Director. VI + 1,327 pp. Annual reports of state officers, departments, bureaus, boards, and commissions for the fiscal year ending September 30, 1924. (Apply to the Bureau, Indianapolis, Ind.)

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On the Calendar of Conventions

SEPTEMBER 1-3.—SUNBURY, PA.
Association of City Planning Commissions of Cities of the Third Class in Pennsylvania. Annual convention. Secretary, Leo J. Buettner, Johnstown, Pa.

SEPTEMBER 1-3.—SUNBURY, PA.
League of Cities of the Third Class in Pennsylvania. Annual convention. Secretary, Fred H. Gates, City Clerk, Wilkes-Barre, Pa.

SEPTEMBER 2-4.—TORONTO, ONT.
Ontario Municipal Association. Annual convention. Secretary, Horace L. Brittain, 189 Church Street, Toronto, Ont.

SEPTEMBER 8-11.—On Board S. S. Richelieu, en route from Montreal to Quebec and Saguenay River
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

SEPTEMBER 11-12.—SIOUX CITY, IOWA
Iowa Association of Commercial Organization Secretaries. Annual meeting. Secretary, G. B. Eastburn, *Marshalltown, Iowa.*

SEPTEMBER 14-17.—ROCKFORD, ILL.
American Institute of Park Executives and American Park Society. Annual convention. Secretary-Treasurer, Will O. Doolittle, Box 432, Rockford, Ill.

SEPTEMBER 14-18.—DETROIT, MICH.
Illuminating Engineering Society. Annual convention. General Secretary, Norman D. Macdonald, 80th Street and East End Avenue, New York, N. Y.

SEPTEMBER 15-18.—DECATUR, ILL.
American Society of Sanitary Engineering. Annual meeting. Secretary, James R. Walker, 105 Cummings Street, Boston 18, Mass.

SEPTEMBER 21-24.—HAMILTON, ONT.
Dominion Association of Fire Chiefs. Annual convention. Secretary, Chief James Armstrong, Box 50, Kingston, Ont.

SEPTEMBER 22-24.—QUEBEC, CANADA
Canadian Good Roads Association. Twelfth annual Convention. Secretary, George A. McNamee, Ground Floor, New Birks Building, Montreal, Que.

SEPTEMBER 28-OCTOBER 2.—CLEVELAND, OHIO
National Safety Council. Annual congress. Managing Director, W. H. Cameron, 168 North Michigan Avenue, Chicago, Ill.

SEPTEMBER 28-OCTOBER 3.—LONG BEACH, CALIF.
League of California Municipalities. Annual convention. Executive Secretary, William J. Locke, 707 Chancery Building, 564 Market Street, San Francisco, Calif.

SEPTEMBER 28-OCTOBER 4.—PARIS, FRANCE.
International Congress of Cities. Arranged by the Union Internationale des Villes et Communes and the Union des Villes et Communes de France. Secretary-General and Director, M. Emile Vinck, Union Internationale des Villes et Communes, Rue de la Regence, 3bis, Bruxelles, Belgium. Paris headquarters: 29 Rue de Sevigne, Paris 3e. American headquarters: Office of THE AMERICAN CITY MAGAZINE, 443 Fourth Avenue, New York.

SEPTEMBER 29-OCTOBER 1.—WESTERN UNIVERSITY, LONDON, ONT.
Canadian Tax Conference and Canadian Civil Service Research Conference of the Citizens' Research Institute of Canada. Secretary, H. L. Brittain, 189 Church Street, Toronto, Ont.

SEPTEMBER 29-OCTOBER 9.—LOUISVILLE, KY.
International Association of Fire Engineers. Annual convention. Secretary, James J. Mulcahey, City Hall, Yonkers, N. Y.

OCTOBER 5-6.—BOSTON, MASS.
Massachusetts Federation of Planning Boards. Twelfth Annual Conference on City Planning. Executive Secretary, Edward T. Hartman, 37 State House, Boston, Mass.

OCTOBER 5-10.—ASHEVILLE, N. C.
Playground and Recreation Association of America. Annual Recreation Congress. Secretary, H. S. Braucher, 315 Fourth Avenue, New York, N. Y.

OCTOBER 8-9.—CHICAGO, ILL.
Illinois Chamber of Commerce. Annual meeting. General Secretary, Harvey T. Hill, 10 South La Salle Street, Chicago, Ill.

OCTOBER 12-13.—WINCHESTER, VA.
League of Virginia Municipalities. Annual convention. Secretary, Morton L. Wallerstein, 408 Travelers Building, Richmond, Va.

OCTOBER 12-15.—ST. LOUIS, MO.
American Red Cross. Annual convention. Secretary, Mabel T. Boardman, National Headquarters, Washington, D. C.

OCTOBER 12-15.—TULSA, OKLA.
Southwest Water Works Association. Annual meeting. Secretary, R. D. Morgan, Mexia, Tex.

OCTOBER 13-14.—HARRISBURG, PA.
Pennsylvania Commercial Secretaries' Association. Annual convention. Secretary-Treasurer, Donald J. Howard, Chamber of Commerce, Altoona, Pa.

OCTOBER 14-15.—HARRISBURG, PA.
Pennsylvania State Chamber of Commerce. Annual meeting. Secretary, George E. Foss, 101 Telegraph Building, Harrisburg, Pa.

OCTOBER 14-16.—MONTREAL, QUE.
American Society of Civil Engineers. Fall meeting. Secretary, George T. Seabury, 33 West 39th Street, New York, N. Y.

OCTOBER 19-22.—ST. LOUIS, MO.
American Public Health Association. Annual meeting. Secretary, Homer N. Calver, 370 Seventh Avenue, New York, N. Y.

OCTOBER 21-23.—OTTAWA, KANS.
League of Kansas Municipalities. Annual convention. Secretary, John G. Stutz, Lawrence, Kans.

OCTOBER 26-28.—KANSAS CITY, MO.
National Association of Commercial Organization Secretaries. Annual meeting. Secretary-Treasurer, A. V. Snell, Chamber of Commerce, Jacksonville, Fla.

OCTOBER 26-29.—DES MOINES, IOWA
American Society for Municipal Improvements. Annual convention. Secretary, Charles Carroll Brown, P. O. Box 1134, Lakeland, Fla.

OCTOBER 27-31.—RICHMOND, VA.
American Country Life Association. Annual meeting. Secretary, Henry Israel, Room 1849, Grand Central Terminal Building, New York, N. Y.

NOVEMBER 5-6.—KINGSTON, ONT.
Ontario Associated Boards of Trade and Chambers of Commerce. Annual meeting. Secretary, T. Marshall, Royal Bank Building, Toronto, Ont.

NOVEMBER 7-14.—JACKSON, MISS.
American Prison Association. Annual congress. General Secretary, E. R. Cass, 138 East 15th Street, New York, N. Y.

NOVEMBER 9.—NEW ORLEANS, LA.
National Tax Association. Annual meeting. Secretary, Alfred E. Holcomb, 195 Broadway, New York, N. Y.

NOVEMBER 9-14.—SAN FRANCISCO, CALIF.
The All-Western Road Show. Address: Edward R. Bacon, of Edward R. Bacon Company, Folsom at 17th Street, San Francisco.

NOVEMBER 16-19.—MIAMI, FLA.
Atlantic Deeper Waterways Association. Annual convention. Secretary-Treasurer, Wilfred H. Schoff, 1405 Widener Building, Philadelphia, Pa.

NOVEMBER 17-19.—GRAND RAPIDS, MICH.
International City Managers' Association. Annual convention. Executive Secretary, John G. Stutz, Lawrence, Kans.

NOVEMBER 17-19.—PITTSBURGH, PA.
Joint Convention of National Municipal League, American Civic Association, Governmental Research Conference, and National Association of Civic Secretaries.

NOVEMBER 30-DECEMBER 3.—NEW YORK, N. Y.
American Society of Mechanical Engineers. Annual meeting. Secretary, Calvin W. Rice, 29 West 39th Street, New York, N. Y.

JANUARY 11-15.—CHICAGO, ILL.
American Road Builders' Association. Annual convention and Road Show. Secretary, Ethel A. Birchland, 37 West 39th Street, New York, N. Y.

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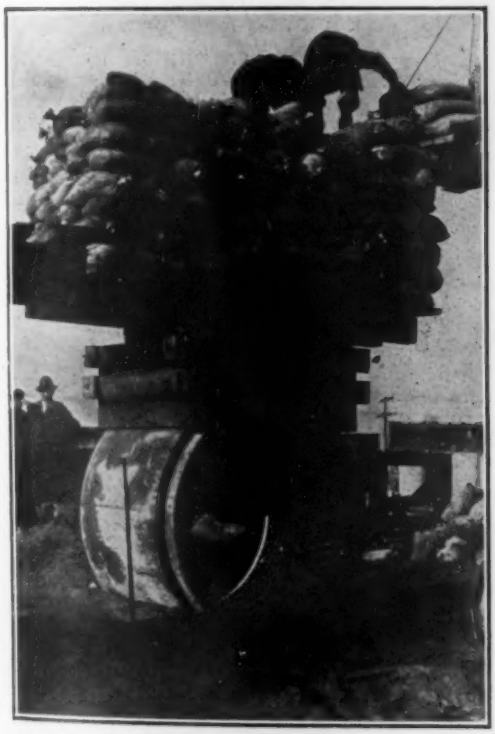

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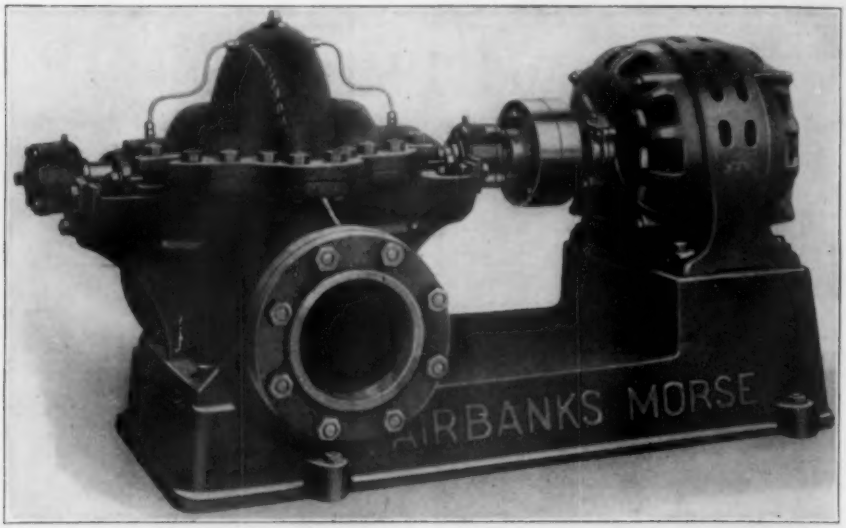

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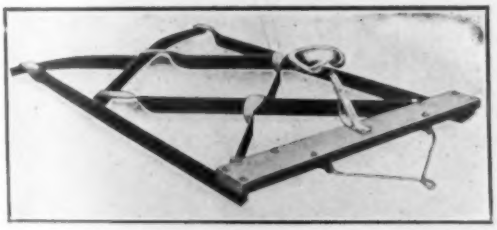
In addition to the strength and smoothness of this pipe, it has the advantage that a tight sewer can be laid using cement mortar for the joints. The walls of the pipe are impervious to water, and the mortar used in the joints bonds so well with the concrete pipe that the amount of infiltration that occurs is negligible and no opportunity is offered for roots to penetrate the joints and the sewers.

A New Steel Road-Drag

A steel road-drag which is capable of taking the rhythmic bumps out of "washboardy" highways, has been placed on the market by the Miskin Scraper Works, Ucon, Idaho. This zigzag road-drag is 7½ feet wide and 14 feet long and weighs about 700 pounds. It is made of ¾ by 6-inch plow steel throughout and is guaranteed by the manufacturers to stand the rough usage to which it must be put in maintaining all types of dirt roads. The drag is long enough to span over and deposit loose material in small depressions while scraping the high spots, thus eliminating waves



STEEL ROAD-DRAG WHICH CRISSCROSSES MATERIAL TO FILL DEPRESSIONS

in the road.

By its form of construction, as noted in the illustration, it keeps the loose material zigzagging from one side of the drag to the other, filling the ruts and holes as it moves, and finally spreading nearly all of what is left out at the left-hand rear corner toward the center of the road, if the drag is driven with traffic. The drag is not so heavy but that four medium-size horses can pull it all day with few rest periods, and one tractor can handle it readily.

French Government Mission Studies Brick Roads in America

The national roads of France, many of them wrecked by the heavy traffic of war, and others scattered over the landscape by German and allied bombardment, are again in their perfect pre-war condition, according to information brought to this country by a French Government mission sent here to study the manufacture and use of vitrified paving brick, and reported by the National Paving Brick Manufacturers Association, Cleveland, Ohio.

The mission arrived in New York June 1, and is devoting its time to making a survey of America's paving brick industry. The mission is composed of Leon Yeatman, President du Syndicat des Fabricants de Products Ceramiques de France, and Jean Baptiste Fauchon, Engineer of Arts and Manufacture. The organization of which Monsieur Yeatman is the head corresponds to the American Ceramic Society.

"France is looking for a type of pavement that will not require constant maintenance and upkeep expense," said Monsieur Yeatman in explaining his mission. "In casting about for such a pavement in our own country we found a large brick industry already established and to a great extent idle. Immediately after the war the French Government encouraged the building of brick plants to furnish building material for reconstruction purposes. Many brick companies were formed. So long as reconstruction demands continued, they were busy. To-day most of the reconstruction work has been completed and the supply of building brick greatly exceeds the demand.

"Observant of this condition, the Government set up an inquiry as to the availability of these brick for road-building purposes, but we find that our building brick and your paving brick are two radically different products. Our brick are much too soft, and it is a part of this mission's object in visiting your country to determine, from an examination of your shales and fire-clays, whether we have in our country raw material suitable for the manufacture of really vitrified paving brick.

"Thus far, France has used chiefly concrete and macadam pavements, the latter treated with bitumen. Since the war we have worked hard and have succeeded in putting our roads into their excellent pre-war condition. However, the cost of keeping our streets and roads in repair is enormous, and France hasn't got the money. The only pavement in France that we are not acquainted with is the brick pavement, and these several reasons explain our government's interest in the brick pavements and the manufacture of brick in your country."

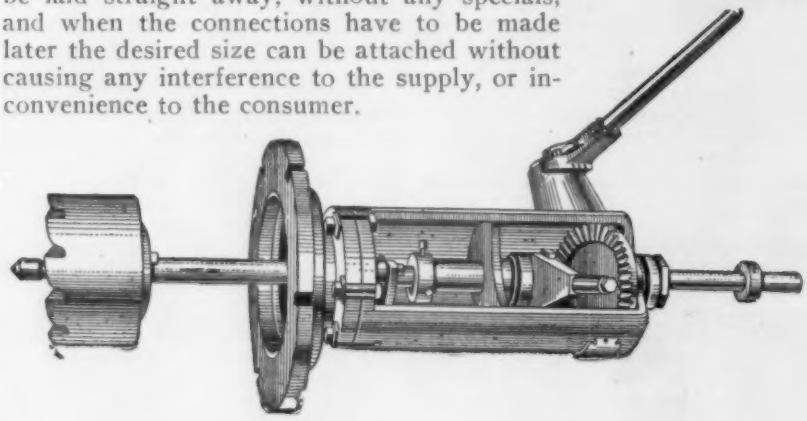
American tourists in France may not be acquainted with the system of maintenance which keeps French roads always in a high state of repair. Mr. Yeatman explained this as follows:

"Every mile or two and sometimes three of every main road in France is under the personal care of an individual who is held strictly responsible for its condition," he said. More often than not, the men you see working along the French roads with their shovels of crushed stone and pots of bitumen have been on that same section, doing that same task, for all of their adult life. They know every hole and every hump. They could find them blindfolded. They know every detail of the construction of the road and all about its drainage. They know the weight speed, and intensity of traffic. There is nothing else in their lives, with perhaps the exception of their homes, in which they take such personal pride as they do in keeping their section of road in the finest possible condition."

High Grade Water-Works Supplies

SMITH TAPPING APPARATUS

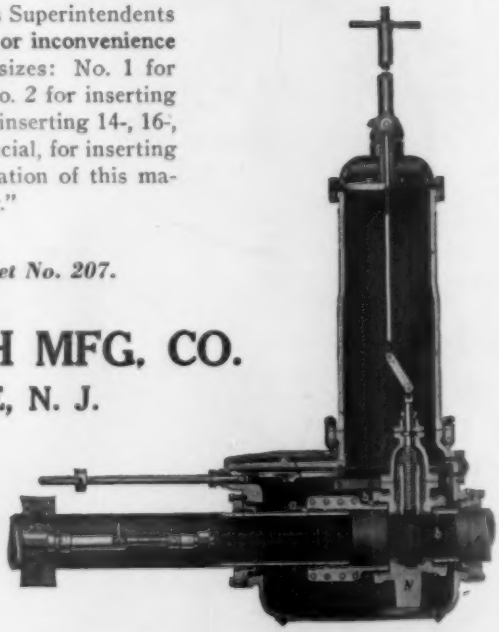
Illustration shows the Improved Model Machine for connecting mains without shutting off the pressure. It is used in every City of any size throughout the United States and Canada, and with this machine in use, pipe can be laid straight away, without any specials, and when the connections have to be made later the desired size can be attached without causing any interference to the supply, or inconvenience to the consumer.



The Perfect Valve Inserting Machine

was designed to enable Water-Works Superintendents to install proper valves **without risk or inconvenience to consumers.** It is made in four sizes: No. 1 for inserting 4-, 6- and 8-inch valves; No. 2 for inserting 8-, 10- and 12-inch valves; No. 3 for inserting 14-, 16-, 18- and 20-inch valves; and No. 4, special, for inserting 24-inch horizontal valves. The operation of this machine is "as simple as rolling off a log."

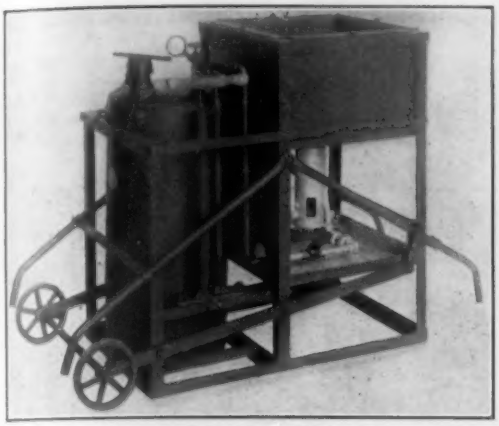
Write us for illustrated booklet No. 207.



THE A. P. SMITH MFG. CO.

EAST ORANGE, N. J.

Makers of Smith Tapping Machines, Fire Hydrants, Lead Furnaces, Pipe Cutting Machines, Gate Valves and Other Water-Works Specialties.



LEAD-MELTING FURNACE WITH OIL BURNER

A New Portable Lead Furnace

A portable furnace for use in melting lead to make joints in water pipes has recently been produced by the Chausse Oil Burner Company, 1227 West Beardley Avenue, Elkhart, Ind. This machine is a combination of a Chausse oil-burning torch equipment with a retort, mounted on a framework with wheels. The forge weighs about 160 pounds empty, and over-all it is 20 inches wide, 36 inches long, and 33 inches high. The heating chamber is 14 x 14 x 16 inches high and is lined with fire-brick with the flame entrance from the bottom. The kerosene tank holds 12 gallons, which is sufficient for 12 hours' operation at maximum temperature. The burners, consuming one gallon per hour, will deliver sufficient heat to melt 200 pounds of lead in from 20 to 30 minutes from a cold start. The maximum temperature generated from the burners is 1,800 degrees, and any reduction in the amount of heat generated will of course decrease the fuel consumption. Pressure on the tank is maintained between 10 and 20 pounds by a Chausse hand pump.

An interesting feature of this machine is the movement of the wheels, which are so arranged that when the forge is stationary, it stands horizontally on its base. By lifting on the handles at the rear, the side opposite the wheels, the wheels are lowered and the machine can be moved from place to place without tilting. When it is set down, the wheels rise.

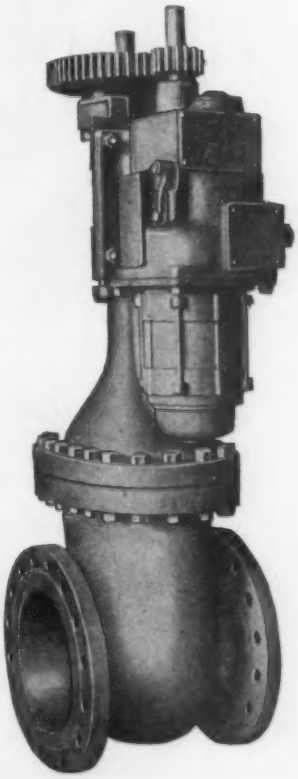
Simplex Moves Pittsburgh Offices

The Simplex Valve and Meter Company, 57th and Race Streets, Philadelphia, Pa., announced a change of address for its Pittsburgh branch from 1914 Union Bank Building to 718 Empire Building, Pittsburgh, Pa.

Remote Control for Motor Operation of Water-Main Valves

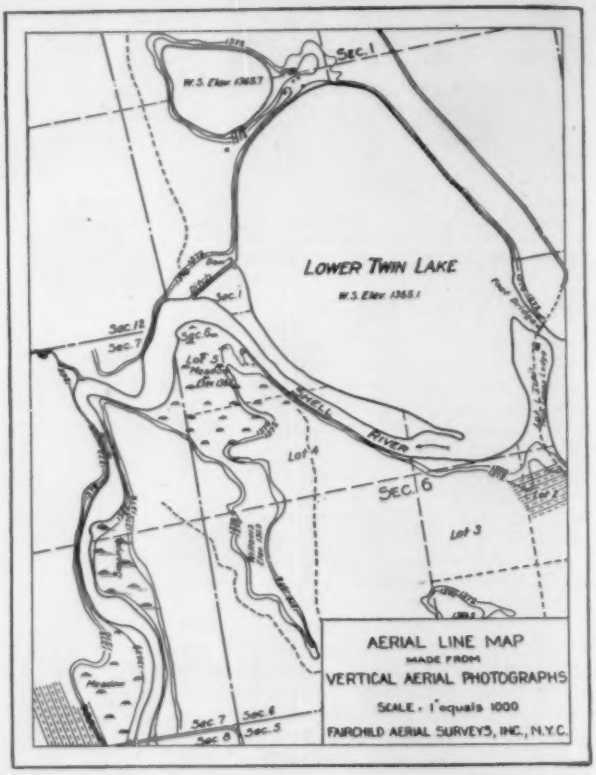
The necessity for the motor operation of important water valves has been fully established during the last few years. The problem, however, of supplying a dependable and efficient electrically operated system has given considerable concern to engineers, and to valve manufacturers and users. The Cory-Recony standardized unit control, which has been the outcome of careful study over a period of years and the operation of valves under all service conditions, has, according to the manufacturers, Chas. Cory & Son, Inc., 183-7 Varick Street, New York City, succeeded in fulfilling the many desired requirements for electric motor operation of valves. The construction of the Cory-Recony controls is very rugged and simple, insuring reliability and ease of operation.

Some of the features of this unit are that it is equipped with gate obstruction, automatic safety control and may be remotely controlled from any number of points for closing only, for opening only, or for opening, closing and throttling. There are no electric power circuits opened in operating the unit, a separate power panel being provided. The units may be operated in any position, as there is no oil or grease to injure the motor and electrical insulation. The valves can be driven to seat under full power, as electrical braking is provided at the motor, which stops the unit instantly. Simple and positive adjustments are provided for the limit switches, so that the limits may be easily set and the adjustment maintained until changed manually. Position signal lights are provided at the control station, red showing when the valve is open, and green when the valve is closed. Safety is assured to the operating personnel and to the valve by means of a safety declutch when operating the valve by hand or when making repairs to the valve. A white safety signal light at the control station indicates when the safety clutch is out.



VALVE EQUIPPED WITH CORY ELECTRIC OPERATING DEVICE

WATERSHED STUDIES



The map above illustrates the possible refinement of the Fairchild Aerial Line Map. The original scale was 1"=1000' with contour intervals of two feet. The client has contracted for two additional areas since the first survey was completed. Evidently satisfied!

Areas of water sheds can be determined quickly and accurately by studying over-lapping vertical aerial photographs under the Fairchild Stereoscope. The same photographs used as plain table sheets will reduce the field work for your topographic map in half. The resulting map of accurate detail can be completed for less than half the cost of the usual ground survey.

Fairchild Aerial Line Maps effect enormous savings in surveys for watersheds and for sewerage planning.

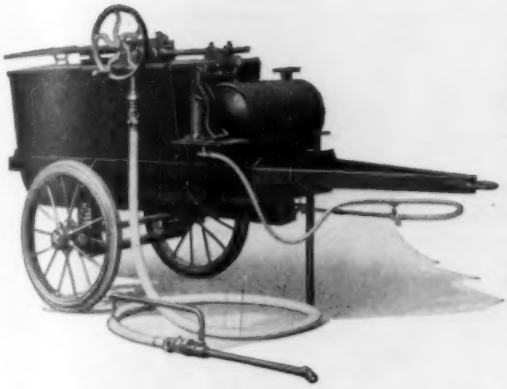
Let us explain this simple method of saving time and dollars.

Complete information on request.

FAIRCHILD AERIAL SURVEYS

INCORPORATED

270 W. 38th St. New York City



HAND-OPERATED SPRAYING EQUIPMENT FOR BITUMINOUS MATERIAL

A New Hand Spraying Device for Maintenance Work

A simple hand spraying device which makes it possible to apply hot bitumen to the road under pressure in much the same manner as the larger distributors, has been developed by Littleford Brothers, 500 East Pearl Street, Cincinnati, Ohio, in its new oil-burning melting kettle No. 84-W.

The Littleford hand spraying attachment, although designed for maintenance work, has been found practical to use on new paving and reconstruction work. The construction is very simple and there are no mechanical parts to get out of order. The hand pump is mounted on a fully adjustable frame which makes it adaptable to all types and sizes of heating kettles. A large, flexible metallic hose is used to connect to the spray bar, which is held by the operator and in the end of which is an adjustable spray tip.

An Effective Snow-Plow on a Two-Way Drive Truck

The Russell Car & Snow Plow Company, Ridgway, Pa., makers of Russell snow-fighting equipment for steam and electric railroads, have developed and are manufacturing a snow-plow and sweeper for cleaning streets and highways. A unique feature of this equipment is the use of a Two-Way Drive motor truck for mounting the cleaning equipment. This truck is operated with equal facility in either direction. This special construction enables the driver to go backward or forward, always facing his objective. The truck has five speeds in either direction and the same pushing power and speed both ways. The use of this truck permits of a short coupled equipment easily operated even on narrow streets, and with it the snow-fighting equipment may be suspended directly over the drive wheel, not only insuring increased traction, but minimizing the side thrust usually encountered in operating a snow-plow.

RUSSELL SNOW-PLOW ON TWO-WAY TRUCK IN ACTION

The equipment may be had in various combinations, either single or double end and with snow-plow or sweeper or both. The plows are built in both the single-track or V-type and the double-track or share type. The sweeper is an adaptation of the improved bevel gear drive type which was originated by this company for the electric railway field and which has met with remarkable success. The rotary brooms are driven by means of an independent gasoline motor, fully equipped, mounted in the cab.

Side wings or levelers are provided which increase the clearance, so that an 18-foot roadway may be readily cleaned the entire width in one operation. The operators of the machines are comfortably housed in a weather-proof cab.

During the warmer months when not required for snow fighting, this equipment, if desired, can be easily removed and the truck put into general utility use. It can also be readily fitted with a dump body made especially to fit this truck.

ROAD CLEARED BY ONE PASSAGE OF RUSSELL SNOW-PLOW

A One-Man Grader with Power Lift

The new substantial one-man grader which has been developed by the Acme Road Machinery Company, Frankfort, N. Y., uses the dependable Fordson engine as its power-plant and operates with an 8-foot mold-board. The operator sits behind the controls and lever while operating the power-controlled blade and does not have to move to handle them. The mold-board or grader blade is mechanically raised and lowered by a worm and vertical steel screw leading to a control directly in front of the driver. The worm operates directly on the power take-off on the right-hand side of the Fordson power-plant. The use of power for raising and lowering the blade does away with a foot pedal and the need of winding the blade up and down by hand. Easy vision not only of the controls but of the road makes for efficient operation.

The position of the scarifier at the rear of the

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HERE is a bulletin in which the manufacturer or his product is not mentioned in the text.

Its forty pages are packed full of transformer engineering data and practical information for the man who operates transformers.

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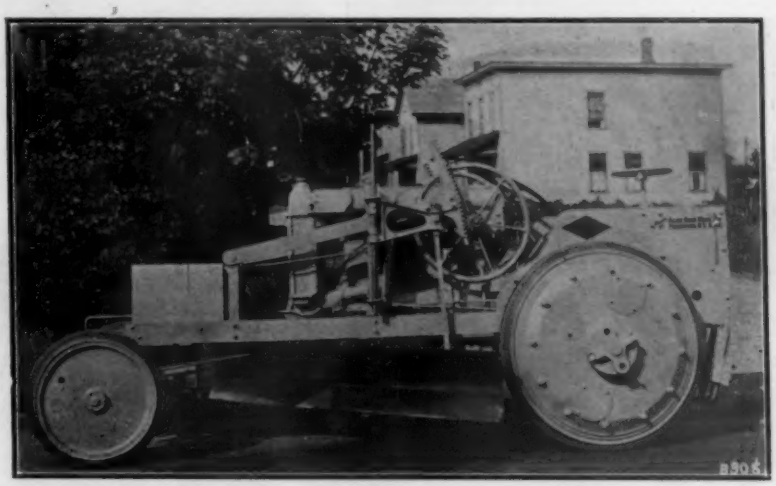
Manufacturers of Power, Distribution and Street Lighting Transformers

KUHLMAN TRANSFORMERS



ACME ONE-MAN POWER GRADER WITH POWER LIFT FOR BLADE

rear wheels gives more efficient operation of the scarifier because the wheels by which the machine is propelled forward are always operating on hard ground, the teeth picking up the dirt behind the wheels. Where the ground is scarified ahead of the wheels, the driving wheels are forced to secure their traction in soft material, which is not advantageous.

The rear wheels of this Acme-Fordson grader are mounted on separate axles instead of on the rear axle of the Fordson. This separate axle runs all the way through the frame and is driven with a bull pinion onto a large bull gear which reduces the speed of the tractor engine three times and increases its pulling power proportionately. This type of drive has permitted the installation of a locking device which locks both rear wheels so that they may be run as a single unit. This is particularly advantageous when one of the wheels gets into a soft spot and starts to spin. By locking the wheels, the other wheel is able to pull the machine out, whereas if the differential action on the axle of the Fordson were permitted to operate, the wheel would spin and dig a hole for itself.

The mold-board has a particularly high clearance, making it possible to set it at a more acute angle when used for plowing. This gives a deeper cut and permits heavier work.

The construction of the outfit makes it possible to quickly remove the power-plant and install a new one with very little cost and in a short space of time. The unit taken as a whole is economical in gasoline consumption because of the speed reduction which permits its operation on less throttle. The machine weighs about 8,500 pounds, and with this additional weight there is less tendency for the mold-board to be pulled out of the ground and make a wavy road. This unit is not only adaptable to reasonably heavy grading, but is admirable for snow removal work.

Monarch Tractor Announces New Appointments

Monarch Tractors Inc., Watertown, Wis., has announced the appointment of R. W. Gotshall as Vice-President and General Manager, and H. B. Baker as Vice-President and Director of Sales. Mr. Gotshall was formerly assistant manager of the Holt Mfg. Co., Peoria, Ill., and his experience of seventeen years with that firm included many phases of domestic and foreign sales, designing and engineering, supervision of manufacture, purchasing, and other executive offices. Mr. Baker was sales manager of the Holt Mfg. Co., for the last twelve years, and under his direction the sales organization developed in this and foreign countries was the largest and most productive in the industrial tractor industry.

EXAMPLES OF EFFICIENT TRAFFIC CONTROL WITH SILVER BRAND WHITE TRAFFIC ZONING PAINT, MANUFACTURED BY THE WAMBLU PAINT AND VARNISH WORKS, ROCHESTER, N. Y.

KYROCK on old brick street at Seymour, Ind.

Kyrock surfaces on old roadways which are solid but rough, will give service equal to complete new pavements—at one-half the cost. Hundreds of miles on old macadam, gravel, telford brick, concrete and asphalt. No heating or special equipment needed to lay Kyrock.

Write for brochure A.C.

Kentucky Rock Asphalt Company

Incorporated

Marion E. Taylor Bldg., Louisville, Ky.

MACK TRUCK CRANE WITH LONG BOOM IN SERVICE

A New Portable Crane for Light Trucks

By virtue of its mobility, the motor truck crane is able to serve a large number of people whose business does not warrant the installation of stationary hoisting devices. The International Motor Company, 25 Broadway, New York City, has developed a light truck-crane combination for mounting on Mack trucks of 1½ to 2½ tons capacity. This crane, which was primarily designed for the purpose of unloading 1,000-gallon fuel oil tanks from gondola cars, is adaptable to many other uses, such as handling gasoline drums, barrels, stone slabs, etc., weighing up to 2,500 pounds.

The equipment consists of a mast braced and anchored to the chassis frame, a special drum winch, and two booms, the longer of which is shown in the accompanying illustration. The long boom measures 13 feet, 3½ inches, and has a 16-foot clearance from the ground, while the short boom, measuring 8 feet, 11½ inches, has a 10-foot ground clearance. Both booms have an 8-foot lateral radius, and since the shorter one may be operated with the mast in a lowered position, it is used for general lifting, but where additional clearance is required, as in hoisting from freight cars, the long boom is necessary.

Power is applied to the winch from a power take-off through a one speed forward and reverse gear and a chain drive to the winch-worm sprocket. The controls, consisting of motor clutch and gear shift, are located directly behind the cab on the left side of the mast, and attached to the back side of the cab is an auxiliary gas control which permits the operator to regulate the engine speed without leaving his position at the control levers.

To insure rigidity of the chassis while the crane is being operated, two jack-screws support the mast from the ground. These screws are attached to the cross-members under the mast by means of a swivel arrangement, so that when not in use the free ends may be fastened to brackets on the side of the frame. The entire assembly may be mounted on any standard Mack truck with but little alteration to the body and none to the cab.

Essco Secures Detroit Traffic Signal Contract

C. A. Ward, Sales Manager, Essco Manufacturing Company, Peoria, Ill., reports that this company has been awarded the contract for several hundred traffic signals by the city of Detroit, to be built according to Detroit's specifications.

New Paradon Appointments

The Paradon Engineering Company, 24 South Washington Place, Long Island City, N. Y., has announced the appointment of F. H. Bradford to handle the sales and service of Paradon chlorinators in Illinois, Indiana, Michigan, and Wisconsin. Mr. Bradford is located at 111 West Washington Street, Chicago, Ill. S. P. Rees has been appointed to handle sales and service in the South and will be located at the Camden Building, Atlanta, Ga. C. C. Behney has been appointed for western Pennsylvania, Ohio, Kentucky, and West Virginia. He will be located in the Empire Building, Pittsburgh, Pa.

Electric Trucks

The Autocar Company, Ardmore, Pa., which has been manufacturing gasoline vehicles for nearly twenty-eight years, added electric trucks to their line about two years ago, after investigation had convinced the Autocar executives that there is a logical and progressive demand to apply the distinctive electric economies and advantages to those phases of the hauling problem which can be satisfactorily handled with the limitations of electric speed and cruising radius. This company deems it desirable to concentrate electric sales efforts in the three present largest potential markets, metropolitan New York, Chicago, and Philadelphia, where the acceptance and use of electrics is quite general.

Good Roads *Kept* Good - with Stanolind Paving Asphalt and Stanolind Asphalt Road Oils

Road improvement work may be carried on at low cost and with excellent results when Stanolind Paving Asphalt and Standard Asphalt Road Oils of correct grade are used.

For Improving Dirt and Stone Roads

Standard Asphalt Road Oil of the right grade to meet local conditions will protect and build up ordinary dirt and stone roads. Repeated applications throughout four or five years will provide a base for the higher types of asphalt pavements

For Seal Coats on Oil Roads

Dirt and stone roads which have been treated with Standard Asphalt Road Oil for a period of four or five years may be converted into paved highways by the application of a seal coat of Stanolind Paving Asphalt of the right grade. This will give a wearing course which will last for several years, at a very low cost of upkeep

For Resurfacing Brick Pavements

Rough and badly worn brick pavements may be put into good condition—economically—by resurfacing with Stanolind Paving Asphalt. The application of the proper grade of asphalt, at comparatively low cost, will put the pavement in shape for many more years of service

For Resurfacing Concrete Roads

Where concrete roads have started to crack or to show signs of surface disintegration, resurfacing with Stanolind Paving Asphalt will halt the destruction and make a road which will stand up under all kinds of traffic.

HEAVY summer traffic inflicts grueling punishment on every type of improved road. If roads are to be kept in good condition, maintenance and repairs must be regular and systematic

Attention to small ruts and holes may be given at small cost NOW—and will save expensive operations required later if the road is neglected

Special grades of Stanolind Asphalt and Standard Asphalt Road Oils are made for use in every kind of repair and maintenance work. Twenty-seven branches provide excellent facilities for quick service, and also for expert advice on your particular repair and maintenance problems

Without cost to you, a Standard Road Engineer will be glad to advise you on your repair and maintenance work. Write or telephone our nearest branch

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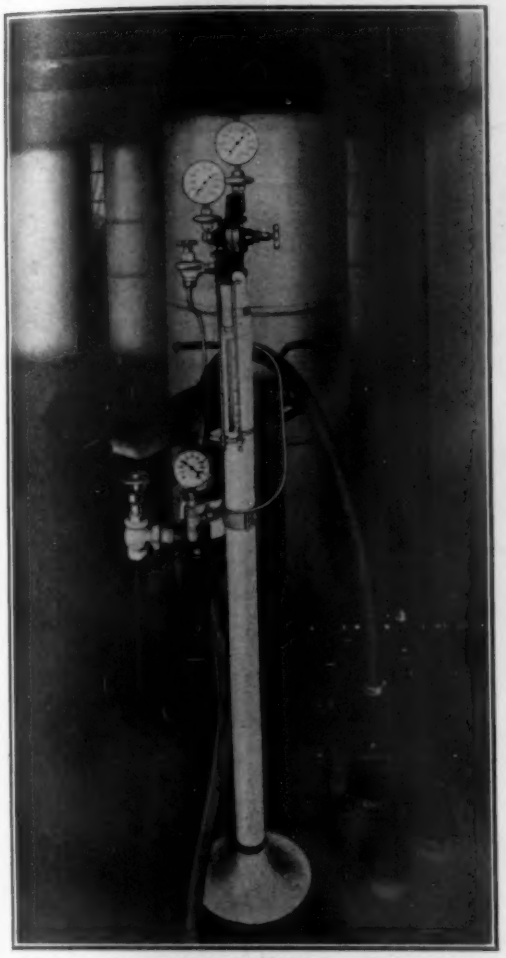


NEW PARADON HIGH-CAPACITY CHLORINATOR OPERATING ON NEW YORK WATER-SUPPLY FROM ONE-TON CHLORINE CONTAINERS

New High-Capacity Chlorinator

The Paradon Engineering Company, Long Island City, N. Y., has developed for the New York City Water Department an injector type chlorinator of much larger capacity than has previously been available. Units of this series with capacities as high as 750 pounds of chlorine per 24 hours have been constructed, as compared with 300 pounds per 24 hours, the heretofore maximum capacity of a single chlorinating unit.

One of these high-capacity chlorinators (750 pounds per 24 hours) was installed on trial last winter at the Ashokan Head Works on the Catskill Aqueduct which furnishes the major portion of New York City's water-supply. So successful was its operation that this unit has now been installed permanently.

The New York Water Department has been using chlorine in ton containers and this high-capacity chlorinator together with these ton containers enables them to greatly simplify operation, eliminating a large number of connections and manifolds, and to economize space and centralize operation. The apparatus is very flexible, having a range from maximum to minimum capacity of 7½ to 1.

Another feature of this apparatus is the automatic chlorine shut-off device which shuts off the chlorine the instant the water pressure drops below the amount required to properly operate the machine. This same device can be used to operate the chlorinator semi-automatically in connection with an automatically operated pump sewage syphon device or any other arrangement where the flow of water or sewage to be chlorinated stops and starts automatically.

The manufacturers state that, as with all Paradon chlorinators, the injector construction eliminates all freezing and chlorine hydrate difficulties, and it is unnecessary to preheat the water-supply of the machine.

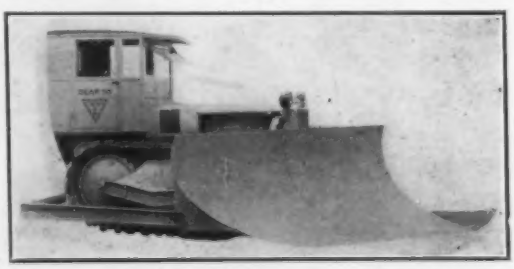
Additional units of this type have been installed by the water departments of Baltimore, Chicago and St. Paul. Three units are also being installed at the new sewage disposal plant at New Rochelle, N. Y., Fuller & McClintock, Engineers.

Fighting Snow with a Tractor

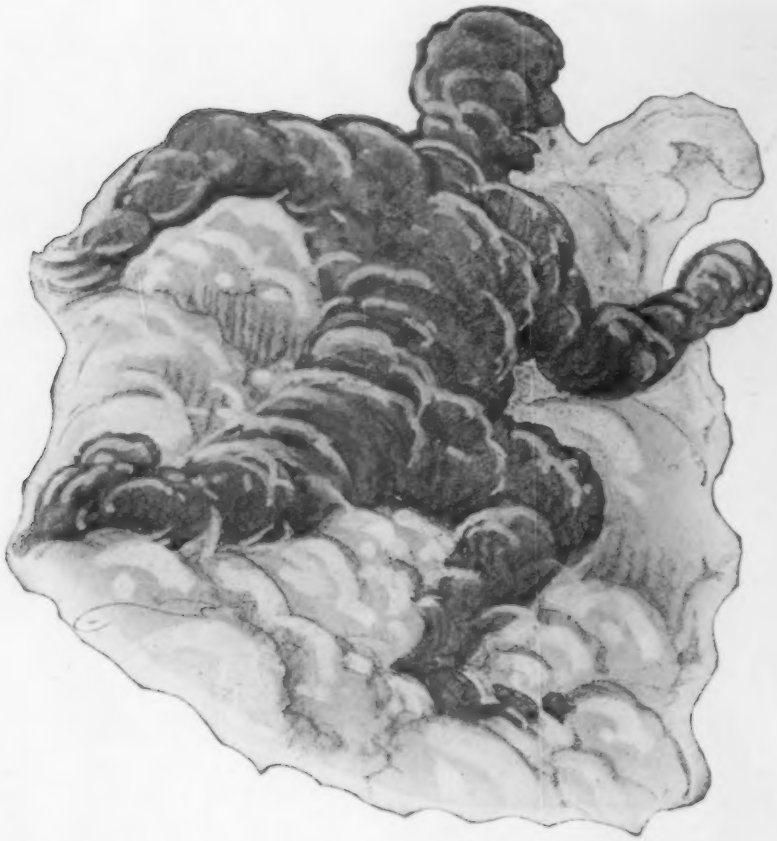
Montreal, famed for its winter sports, witnessed during the winter of 1924-25 a unique battle of the snows, the success of which will no doubt mean far-reaching measures on the same line to keep Canadian highways open to traffic all winter. One road which was the scene of this demonstration of snow removal is the King Edward Highway, the main route of auto tourists entering the Dominion via Northern New York, and the particular stretch was the six miles on the causeway along the St. Lawrence between the towns of La Prairie and St. Lambert, just before turning on to the bridge over the river to Montreal.

The tourist who knows this well-traveled road in the summer time will find it hard to believe that every winter until the last one has found it closed to traffic by the deep-drifted snow by the first week in January. The town of La Prairie, as its name would signify, hitherto has been almost as isolated from Montreal, a few miles distant, as any frontier town. The gales sweeping down the broad expanse of the St. Lawrence for more than 30 miles, hit this 6-mile stretch of road with unabated force and pile the snow to great depths. The high winds then pack it almost hard enough to walk upon.

The conqueror of these conditions is the Mead-Morrison "55" tractor, built by the Mead-Morrison Manufacturing Co., E. Boston, Mass., equipped with a snow-plow. More than once the storms have filled the road over night. The machine, on first getting to work, thus had to raise and push aside walls of snow which buried it from 6 to 8 feet, yet it invariably accomplished its task and opened the road to traffic every day. The tractor



M.-M. TRACTOR WITH V-TYPE SNOW-PLOW



It's Coming!

Before many weeks, your community will be in the clutch of the Great White Menace! Today is none too early to begin preparing to fight it. No matter what the thermometer says now, snow removal will be the same big problem as ever.

Never doubt that snow removal is worth the cost! A single day's blockade means tremendous loss—in paralysis of business—in damage to highways—in human life, sometimes, when physicians are snowbound, or fire occurs.

Be ready with the Champion Snow Plow, the most efficient and economical snow handling machine made. Six types and sizes, that fit standard trucks and tractors. Indorsed by highway officials everywhere. Costs only a few dollars a year to own and operate. Send postal today for new catalog.

THE GOOD ROADS MACHINERY CO., INC.

KENNETT SQUARE, PENNSYLVANIA

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.

MEAD-MORRISON TRACTOR OPENING ROAD AFTER HEAVY SNOWFALL

is of the well-known crawler type, with exceptional tractive power, and ability to keep going under unusually trying conditions, as this demonstration shows.

Rolling Fairways While Cutting

The fundamental value of rolling park turf and fairways is apparent when the destructive effect of frost or continued heavy rains on sod is considered. In the spring of each year after the frost leaves the ground the sod is somewhat broken up and is lifted away from the subsoil, leaving small pockets or air-spaces at frequent intervals. The soil is spongy and the delicate roots of the sod will naturally die from lack of nourishment unless packed more firmly by rolling. This condition also prevails after continuous or heavy rains where roller type mowers are not used.

The land roller, such as made by the Roseman Tractor Mower Company, is used but once each season, but the soil is kept healthy by light rolling when mowing with gang units equipped with hollow rollers. Each heavy rain or a prolonged dry spell will cause the soil to revert to the spongy condition unless light massage treatment is given. While rolling is absolutely necessary, the weight or pressure must not exceed 45 pounds per square foot. This having been learned through experience, Roseman tractors and Roseman mowers are built especially to come under this weight. If a heavy tractor is used daily, the soil is liable to become so hard that the grass roots cannot live.

The average man, standing, places 150 pounds on a space 1 foot by 1½ feet, or 100 pounds per square foot. In walking, he places his weight on 2 square feet, or 75 pounds per square foot. A horse places 1,200 pounds on 4 spots radiating to 4 square feet, or 300 pounds per square foot. A light farm tractor places 3,000 pounds over an area of 5 x 7 feet, but it places 2,000 pounds on the two rear wheels resting on an area of 2 square feet, or 1,000 pounds per square foot. The Roseman tractor distributes its weight of 1,600 pounds evenly over an area 5 feet by 8 feet, or 40 pounds per square foot. The Roseman mower distributes 260 pounds evenly over an area of 7 square feet, or 37 pounds per square foot.

This information is secured from a very interesting booklet filled with facts and photographs, issued by the Roseman Tractor Mower Company, Evanston, Ill.

Heil Sales and Service Changes

The Heil Company, Milwaukee, Wis., has announced the new location for the Heil Northwestern Sales Company offices and warehouse in St. Paul at 2651-3 University Avenue. E. E. Moore and C. R. Sundboom are the distributors in charge of this office which handles Heil business in Minnesota and North and South Dakota.

The Spinks Supply Company, Inc., Memphis, Tenn., Heil distributors in the Tennessee territory, have announced the change of the firm name to the Universal Equipment Company. They have moved to a new location on Riverside Boulevard.

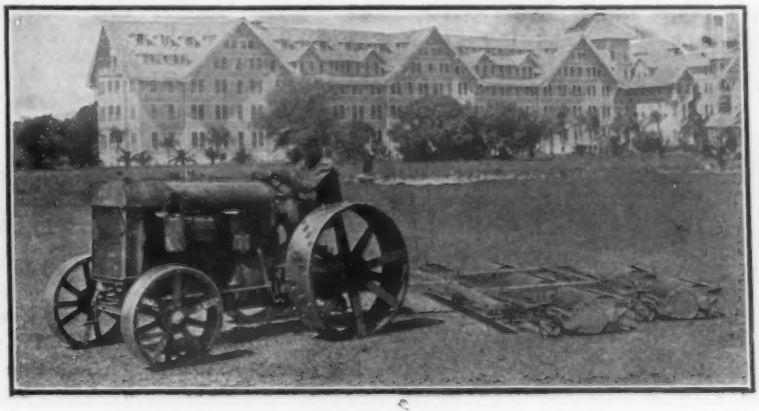
The Watkins Commercial Body Corporation, Buffalo, N. Y., has been appointed distributor for the Heil Company, in that city.

Staley and Morris Move Offices

Staley & Morris, Inc., distributors of contractors equipment in Philadelphia, have announced the removal of their offices to 214-220 North 22nd Street, Philadelphia, where they have 10,000 square feet on the ground floor for their office, display room, warehouse stock, and repair shop.

New Highway Transport Fellowship

Mack Trucks, Inc., 25 Broadway, New York City, has recently established a fellowship in highway transport to be devoted to an investigation during 1925-1926 under the direction of the Division of Highway Engineering and Highway Transport of the University of Michigan, covering an approved subject relative to highway transport.



ROSEMAN TRACTOR MOWER AT BELLEVIEW HOTEL, BELLEAIR, FLORIDA

In thrity-three states this winter, you will find Baker Snow Plows operating and giving their best toward opening avenues of travel—and succeeding, too. The prestige of Baker Snow Plows is earned through years of service. On tractors and trucks throughout the nation, they are making snow moving less dreaded for cities, villages, counties, highway departments, cemeteries and large industrial plants.

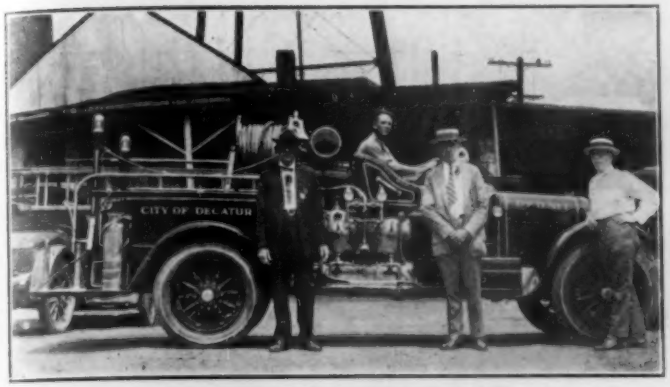
Baker Snow Plows are made to fit any standard motor truck or leading tractor and furnished in "V" or straight blade type. Baker Patent Tripping Blades are real safety features found only on Baker Snow Plows. Secure this protection for your equipment. For sturdy construction and continuous performance it pays to specify Baker Snow Plows. Make your selection now before real winter begins. Don't wait until the snow falls.

Write at once for our big Snow Plow Catalog. State name and model of truck or tractor available.

The BAKER MFG. CO.

503 Stanford Ave., Springfield, Ill., U. S. A.

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.



DELIVERY OF CHILDS MOTOR FIRE APPARATUS ON GRAHAM BROTHERS CHASSIS TO DECATUR, GA.

Left to right.—W. D. Googer, Chief, Fire Department; J. P. Ellis, driver and hose man; Fred W. Gorman, Atlanta District Manager of Foamite-Childs Corporation, and J. S. Looney, City Manager, Decatur

New Chemical Engine for Decatur, Ga., Fire Department

In line with the modern tendency among Georgia cities to give more serious thought to what fire hazards and big losses cost them in high insurance rates and business prosperity, the city of Decatur, Ga., has just accepted delivery of a new double-tank Foamite-Childs chemical engine and hose-car equipment, mounted on a Graham Brothers chassis. This piece of apparatus reached Atlanta from Utica the last of July, and was driven to Decatur for a road test and demonstration of the chemical equipment before the city officials. Chief F. H. Googer, of the Decatur Fire Department, states that this chemical engine will enable them to reach quickly any fire in the district more cheaply than they can operate a heavier truck. Almost all of their fires are small at the beginning, and could be put out with a small hand extinguisher if the property owner had one at hand. But the latter usually hasn't anticipated such trouble by providing his own self-protection, and he promptly sounds the alarm to call the Fire Department.

This speedy truck has two of the latest design soda-acid chemical tanks, each of 40-gallon capacity, with extra charges for both tanks. They can be recharged right at the fire without delay. Over 85 per cent of the fires in the United States to which fire departments are summoned are extinguished by chemical streams, without the necessity of pumping water. In addition to the two 40-gallon tanks, the new truck carries one 2½-gallon soda-acid hand extinguisher, operating on the same chemical principles as the larger tanks, and two 2½-gallon Foamite extinguishers.

Addition to Haiss Plant

The George Haiss Manufacturing Company, 143rd Street and Rider Avenue, New York City, is now completing an addition to its plant, consisting of a 150 x 225-foot one-story building, 28 feet high, equipped with a mezzanine floor of steel, concrete and brick construction. The addition will be used as a machine- and assembly-shop and is equipped with one 15-ton 50-foot span electric crane, one 10-ton 50-foot span electric crane and one 10-ton 25-foot span electric crane. This unit will give the Haiss Company an additional floor space of 40,000 square feet for the assembly of wagon loaders and the new Haiss crawler attachment for Fordson tractors.

New R. D. Wood Representative

R. D. Wood & Company, Philadelphia, Pa., has announced that C. R. McGahey, formerly with the Worthington Pump & Machinery Corporation for a number of years as meter representative, has been appointed district representative of R. D. Wood & Company, with headquarters in the Bona Allen Building, Atlanta, Ga. Mr. McGahey will cover the territory of North and South Carolina, Georgia and Alabama, and will devote particular attention to the water-works equipment department of R. D. Wood & Company.

Expansion of Kansas City Utilities

The municipal Water and Light Department of Kansas City, Kans., has retained Arthur L. Mullergren, consulting engineer, Gates Building, Kansas City, Mo., to prepare plans and specifications for a complete new boiler plant and facilities, consisting of the construction of a new building, with 3,000 H.P. capacity in boilers, coal and ash handling equipment, steam piping and boiler room equipment, at a total estimated cost of $700,000.

New Union Metal District Office

The Union Metal Manufacturing Company, Canton, Ohio, has recently opened a district office at 237 Central Arcade Building, Miami, Fla., to handle the sale of Union Metal lighting standards in the state of Florida. This office will be operated under the name of the Florida White Way Illuminating Company, Inc., and is in charge of Frank E. Filer and C. A. Williams.

GRADING OPERATIONS ON CLEVELAND'S NEW AIR FIELD WHICH IS OVER ONE-MILE SQUARE

This field was cleared and graded by Frank Smith, using 16 Fordson tractors with Schaefer one-man scrapers

City of Chicago Orders
5000 American
Joltite-Granilite Standards
CONTRACT
American Concrete
Products Co.
30 N. La Salle Street
CHICAGO

INTERNATIONAL TRUCK OWNED BY WARREN COUNTY, N. J., EQUIPPED FOR SNOW REMOVAL

Clearing Heavy Snows in Warren County, N. J.

Last winter was one of the severest that Warren County, N. J., has experienced in a score of years. Frequent heavy snow-storms brought the total snowfall to 48 inches. The problem of keeping the county roads cleared was stupendous, but with two 4½-ton International trucks made by the International Harvester Company of America, 606 South Michigan Ave., Chicago, Ill., and owned by the County Board of Chosen Freeholders, and with 10-foot snow-plows, the work was efficiently conducted on 75 miles of the county road.

As an example of how removal was effected after one of the heavy snow-storms, 2 feet of snow fell on January 2. The trucks were worked continuously day and night until the roads were cleared. This snowfall was followed quickly by another of almost equal intensity and was accompanied by strong winds which frequently blew the snow into high drifts. Again the trucks were operated continuously until the roads were cleared. In the summer the two trucks are utilized by the Warren County authorities for road building and maintenance.

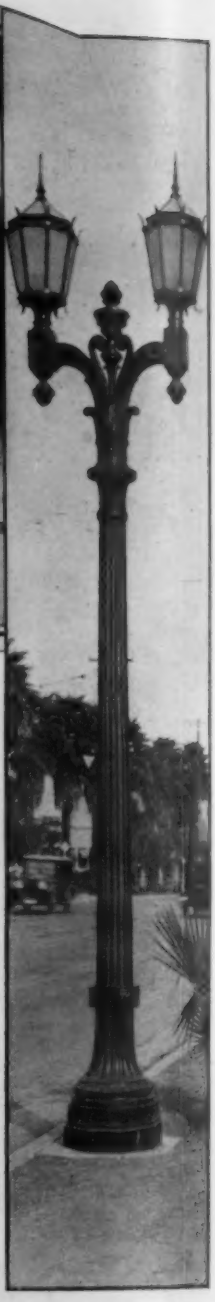
A Dual Control Switch for Traffic Lights

In a traffic control signal system it is essential to facilitate the operation of its various electrical units. This can best be accomplished by the linking up of the several units through mechanical electric switch mechanism that is capable of being readily operated and selective in its functions. A desirable switch mechanism may control an entire signal system or any group of signals in a system or each individual signal for manual and automatic operation. In manual operation the switch must control the signal lights for "Stop" and "Go" or the "Stop" or red signals for all directions. In automatic operation the switch must control the operation of the "Stop" and "Go" signal lights or, with this feature not functioning, the amber flashing signal lights.

The dual control switch made by the Tokheim Oil Tank & Pump Company, Fort Wayne, Ind., and used in connection with the Signaphore system of traffic control signals is a well-made mechanism that controls all the functions of the various electrical units. All operating phases of the signals are controlled by two switch pointers and two push button switches, as illustrated. Hidden from view, but attached to the rear of the panel, is the housing that contains the switch mechanism. This housing is dust- and moisture-proof. The mechanism is made up of two distinct operating units. One switch acts in a primary capacity, controlling the automatic operation of the signals, and has an additional interconnecting feature for the manual operation. The other switch acts in a secondary capacity and controls only the manual operation of the signal. In operating this dual switch mechanism, one is able through the movement of the two pointers to completely control the operation of an entire signal system. This mechanism is equivalent to eight snap switches.

The housing that contains the switch is made up in two pieces—the base and the cover. The cover is of sheet metal and formed so as to make the housing water- and dust-proof. The base supports the switch mechanism. It is made from Bakelite fiber, a material that will not warp and does not absorb moisture. It is the best dielectric and has sufficient mechanical strength to make it a very suitable support for switch mechanism.

Night view on Hollywood Boulevard, Los Angeles. Dozens of other cities and towns in Southern California have adopted Union Metal Lamp Standards for their beautiful streets.



Union Metal Design No. 1193 with General Electric Novalux Lanterns. *All Standards made of enduring copper bearing galvanized steel.*

Every Standard —An Additional Policeman

Dark streets are dangerous streets:—the thoroughfares of your town are safe just to the extent that they are well lighted.

Police forces have not kept up with rapid city growth and increasing motor traffic. This deficiency in public safety must be supplied by ornamental street lighting:—where every standard becomes a silent sentinel to guard pedestrians against thugs and highwaymen and motorists against dangerous traffic accidents.

There is still time, *before winter comes,* for your town to become brighter, safer and more beautiful. A chance during the long winter evenings for your citizens to have many bright hours after sundown.

Union Metal; the largest manufacturers in the world of ornamental lighting standards can be of valuable assistance to you in this important work.

Your copy of this valuable book is now ready. A copy should be in the hands of everyone interested in making his city's streets, Brighter, Safer, More Beautiful. "Better Street Lighting" Book No. 52 mailed on request.

THE UNION METAL MANUFACTURING CO.
CANTON, OHIO

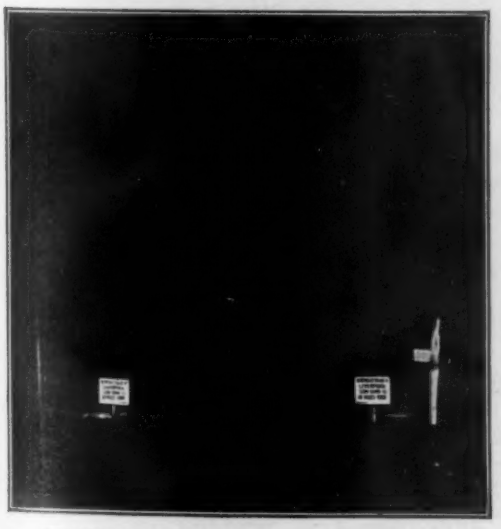
UNION METAL
LAMP STANDARDS

TRAFFIC SIGNS SHOWING LOCATION OF SPOT-LIGHTS

Lighting City Entrance Signs

Chapter 360 of the Laws of New York, Section 288 of Local Ordinances, pages 18 and 19, gives a new problem to the cities of New York state, as it makes it impossible to prosecute a motorist for traffic violations if it can be shown that the city entrance signs on important thoroughfares are not adequately lighted at night. In one large city at least, a case was thrown out by the judge because the defendant's lawyer raised the question of adequate speed-limit sign illumination and no information was available to combat the claim.

A city entrance sign is frequently in such a neighborhood that it is used for a target and often for kindling-wood, so that the placing of any lighting equipment on the sign-board would no doubt result in the disappearance of the equipment in relatively short order. Having this idea in mind, the Crouse-Hinds Company, Syracuse, N. Y., has placed on the market a unit known as the HDA projector, which is mounted on the cross-arms of poles and connected to the street-lighting circuit. This unit operates simultaneously with the street lights, therefore not requiring the services of a special attendant. By means of a very small shaft of light, the entrance signs are strongly illuminated. This lamp is on the overhead system, and therefore cannot be tampered with by any except those interested in its maintenance.



TRAFFIC WARNING SIGNS ILLUMINATED

A New Electric Lawn-Mower

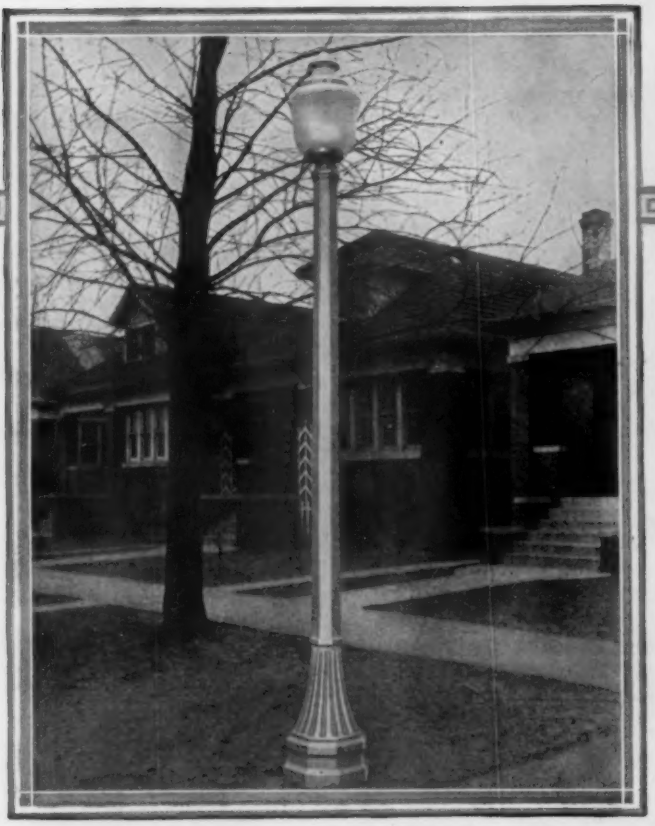
After more than two years of development work and tests, the Coldwell Lawn Mower Company, Newburgh, N. Y., has announced the Coldwell electric-power lawn-mower. Coldwell gasoline-power lawn-mowers have been on the market for twenty-eight years and this latest development has been brought out to supply the demand for a light, practical, and inexpensive power lawn-mower for use on lawns not extensive enough to warrant the purchase of a gasoline machine.

This new unit is simple, quiet, and clean and may be operated by the owner or any member of the family, or a common laborer, since no knowledge of mechanics or electricity is required. The operator merely pushes forward the button of the control switch and then steers the machine wherever it is desired to mow.

THE NEW COLDWELL ELECTRIC LAWN-MOWER

The supply cord is coupled to any lighting socket, the same as in hooking up a vacuum cleaner. About 150 feet of supply wire is carried on the automatic reel which pays out the wire and takes it up automatically, maintaining proper tension to prevention tangling or interference with the operator.

The ½-horse-power universal motor was designed by the General Electric Company, Schenectady, N. Y., to meet the requirements of this machine. The mowing unit is of special design equipped with Timken tapered roller bearings, cut steel gears running in oil, and other special features. The machine cuts a 21-inch swath and weighs approximately 150 pounds.



City of Chicago Purchased 2,200 More Standards

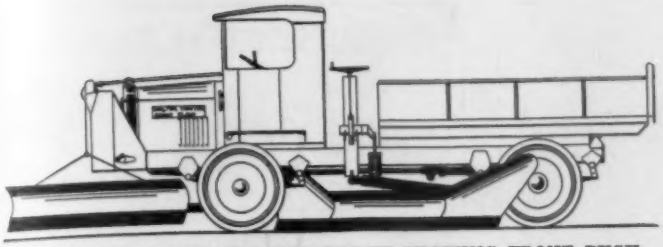
for additional extensions in their residential lighting districts which will make a total of 14,200 concrete lighting standards purchased in the last year for this work. The reason for the concrete standard, as we have told you before, is the lower first cost, no maintenance cost such as paint, rust preventative, etc. The booklets are now available giving complete information on the City of Chicago job and we will be very glad to furnish you with a copy upon request.

CHICAGO CONCRETE POST COMPANY

Paul K. Fleming, *President*

Lawrence, Lamon & Leland Avenues

Chicago, U. S. A.



WALTER SNOW-PLOW TRACTOR TRUCK SHOWING FRONT PUSH-PLOW AND CENTER SCRAPER-PLOW AS WELL AS DUMP BODY

A Heavy-Duty Snow-Plow Tractor-Truck

A piece of equipment which has created considerable interest in highway departments, municipalities, and among motor bus companies is the Walter Snow-Plow Tractor-Truck. This is a four-wheel drive tractor equipped with two special snow blades, a front push-plow and a center scraper-plow. The four wheels are positively driven through patented automatic lock differentials in order to develop maximum traction for snow work. Standard type dump bodies and hoists can be used to cart snow when necessary and used the balance of the year for construction work, refuse removal or other useful service, making the powerful tractor a valuable adjunct for any municipal department.

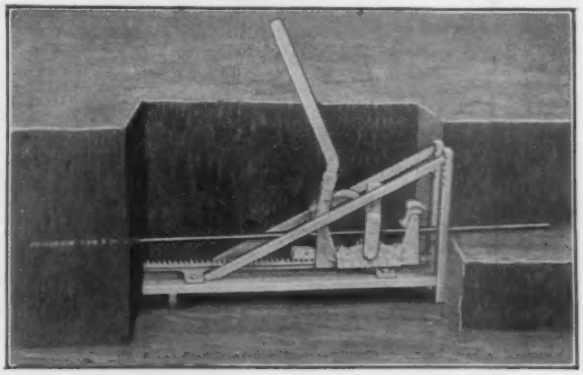
The controls for the Walter plows illustrated in the accompanying drawing are arranged so that there is no interference in the body equipment. The plow controls can be left on. It is only necessary to remove the plow blade, which is quickly done, and then tank bodies for street flushing or road oiling can be mounted and a special power take-off provided to give the necessary pump drive if desired.

The front push blade assembly is removed by disconnecting the lift chain and removing two pins. The center-blade assembly is removed by disconnecting four pins and one large nut. The plow blades can be quickly remounted when necessary. The front push-plow removes the deep drifts and the special center scraper-plow cleans the snow and ice right down to the surface. There is a particular advantage in this as the front plow can be set at any desired height to take care of the heavy snowfall, even at speeds of 20 miles an hour, while the center scraper-plow handles the small remaining amount.

This unit, made by the Walter Motor Truck Company, Queens Boulevard at Hulst Street, Long Island City, N. Y., consists of a 10-foot blade, 20 inches high, with renewable cutting edges, which will swing 40 degrees either way or may be operated straight. The center scraper-plow has a 12-foot blade, 18 inches high with special 3-foot high side-wings and renewable cutting edges. This plow will also swing 40 degrees either way or may be operated straight. The lifting device is a worm and gear operated by two hand-wheels behind the cab, while the lifting device on the front plow is the worm and gear operated by one hand-wheel in the cab.

A Pipe-Pushing Machine for Water and Gas Services

A pipe-pushing machine which saves a large part of the expense of retrenching and refilling in the laying of small service pipes, especially under paved streets, walks and lawns, has been placed on the market by the Marion Machine, Foundry and Supply Company, Marion, Ind. This machine can also be used for cleaning small sewers and for placing drain pipes under cellar floors. The Marion pipe-pushing machine is constructed of malleable iron and steel. It is built with a gear-driven jack so arranged that one or two men can either push iron pipe or jointed tools through the ground under a street or elsewhere or pull a pipe into place. The manufacturers claim that by its use one man can do the work of four under the old methods and at the same time eliminate a large part of the trenching. For replacing an old service it is necessary only to dig the trench 48 inches long by 14 inches wide, place the machine in it, and go to work. The machine is readily reversed.



PIPE-PUSHING MACHINE IN POSITION

WALTER OUTFIT MOVING SNOW ON CITY STREET

If it takes two men eight hours to paint one thousand feet of traffic line by hand, but only ten minutes for a thousand feet with the A. B. C. Traffic Line Marker, why not save this difference?

It can be done because others have done it and we can prove it.

The Highway Appliance Co.
(INCORPORATED)
155 Pine Street, Providence, R. I.

ENGINEERING SERVICE CORPORATION

Economy Designs in Street Lighting

ULTIMATE COMPREHENSIVE PLANS FOR ANY CITY SAVE MONEY ON INSTALLATION, OPERATION AND MAINTENANCE

Montague Ferry
C. H. Shepherd
Consulting Electrical Engineers

38 S. Dearborn St.
CHICAGO
NEW YORK SAN FRANCISCO
LOS ANGELES

"COPPERWELD"
MADE BY THE MOLTEN WELDING PROCESS

WIRE (weatherproof or rubber covered)—The safest for overhead signal circuits. (67% safer than solid copper or iron wire.)
STRAND—for suspended traffic signals—the best obtainable. Copperweld is strong and does not rust away.
GROUND RODS—The permanent protection kind. Non-rusting. Pointed—ready for driving.
WIRE FENCE—Never rusts. Eliminates painting.

Write for Information.

Copperweld Steel Company
MAIN OFFICE & MILLS—BRADDOCK P. O., EDGAR, PA.
30 CHURCH ST., NEW YORK 420 S. JEFFERSON ST., CHICAGO
403 MAILS BLDG., SAN FRANCISCO

Lamp Posts

Service Boxes

Valve Boxes

Write for Prices
&
Complete lighting Catalogue

The Casey-Hedges Co.
Chattanooga, Tenn.

HAISS
Materials Handling Equipment

PORTABLE BELT CONVEYORS

Haiss Loaders or Conveyors will pay for themselves out of savings—for any man who is now shoveling sand, gravel, crushed stone.

Catalogs on request.

TRUCK LOADERS

GEO. HAISS MANF'G CO.
143rd St. & Rider Ave., N.Y.

GURLEY RODS

Gurley makes a *rod for every purpose*. Three widths in lengths up to 16 feet; two, three and four ply sliding rods; hinge joints and sliding lock joints for compactness; a wide variety of level and stadia designs.

Send for the New Rod Bulletin.

W. & L. E. GURLEY
Instrument Makers Since 1845
TROY, N. Y., U. S. A.